



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

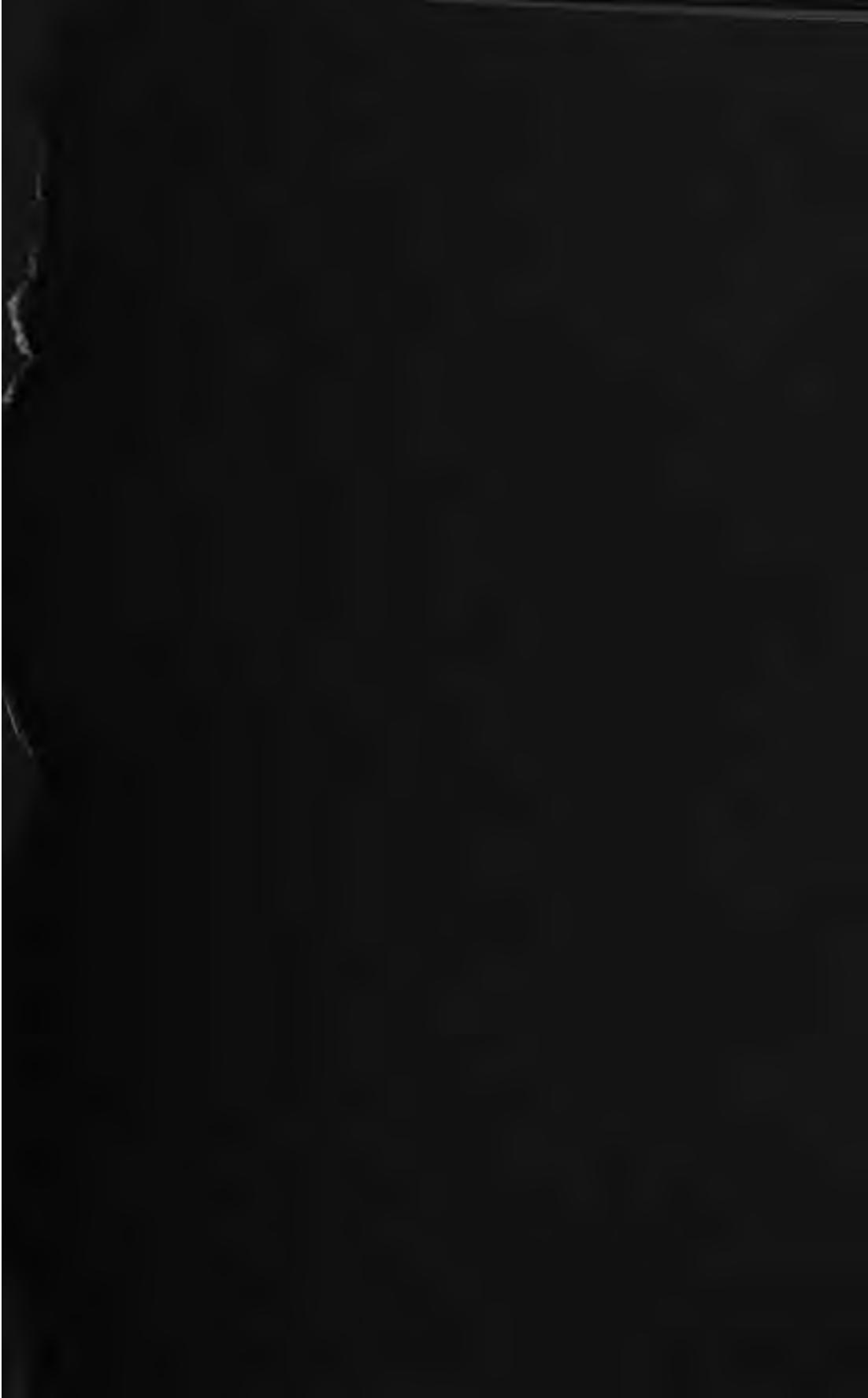
We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

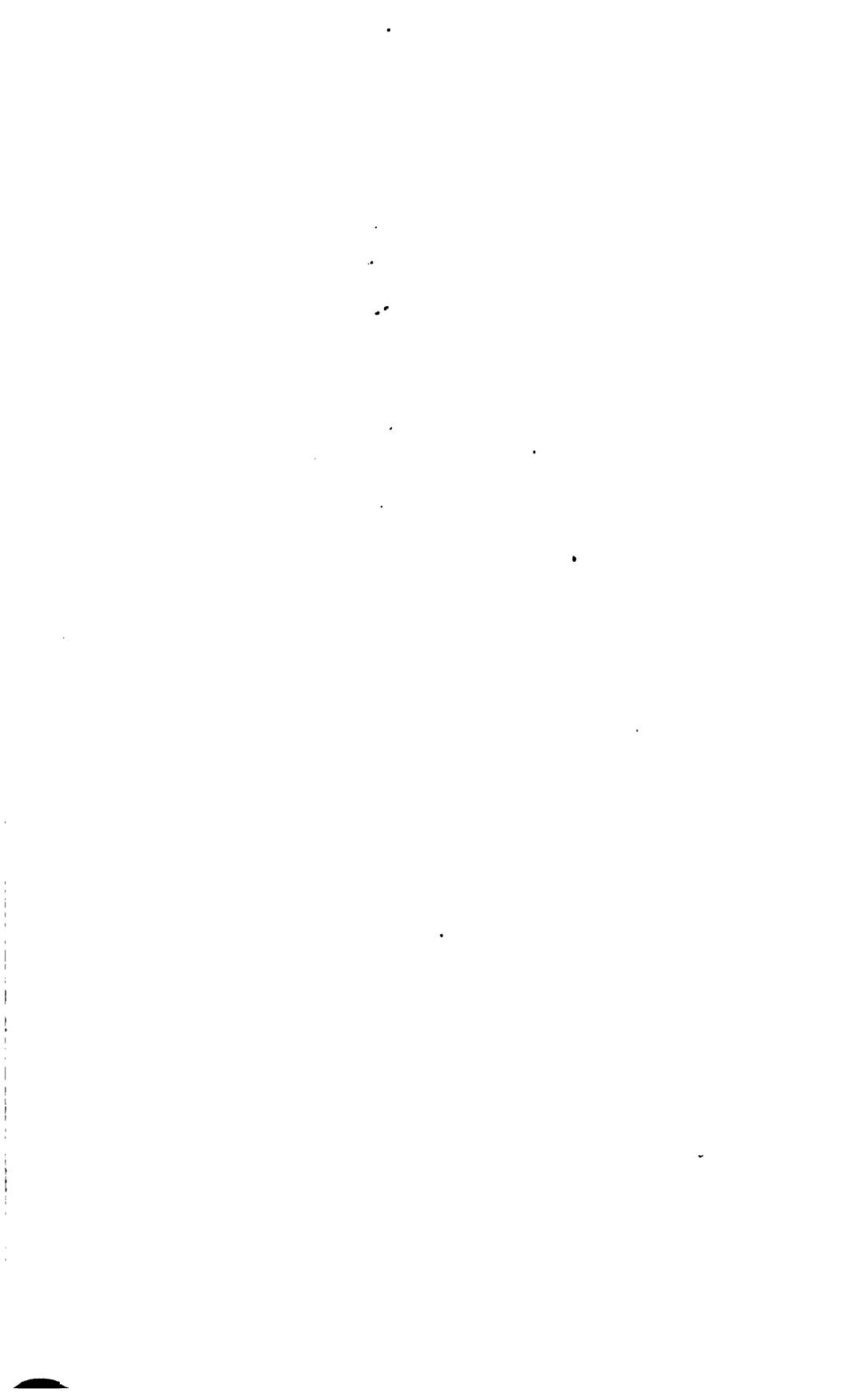
Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>





Ser. 1757 d. 31
1-





Archæological Institute of America.

FIRST ANNUAL REPORT OF THE EXECUTIVE COMMITTEE,

WITH ACCOMPANYING PAPERS.

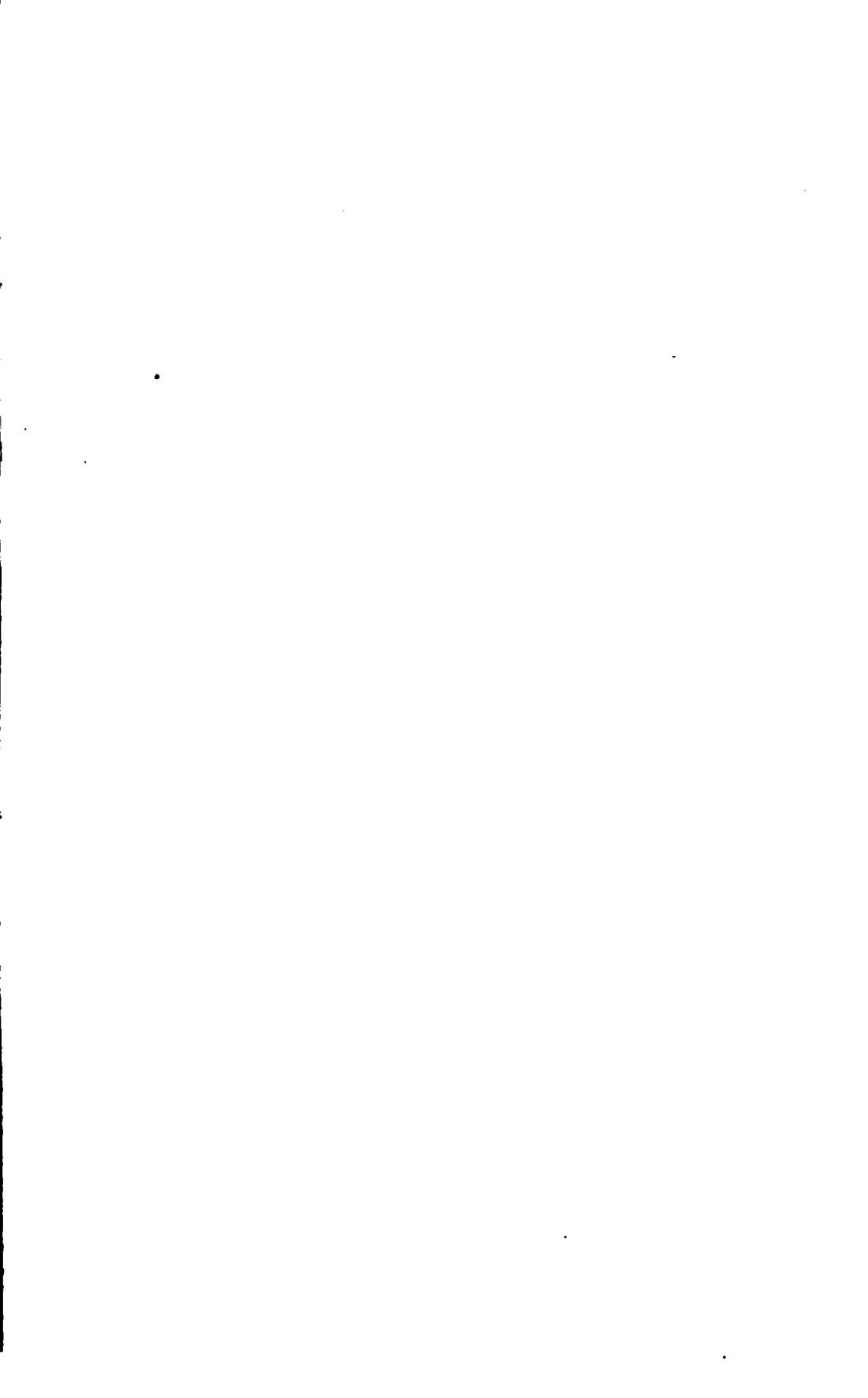
1879-80.

PRESENTED AT THE ANNUAL MEETING OF THE
INSTITUTE,

BOSTON, MAY 15, 1880.



CAMBRIDGE:
JOHN WILSON AND SON,
University Press.
1880.



CONTENTS.

	PAGE
ORGANIZATION OF THE INSTITUTE, AND LIST OF OFFICERS AND MEMBERS	5
ANNUAL REPORT OF THE EXECUTIVE COMMITTEE	13

Papers:

I. A STUDY OF THE HOUSES OF THE AMERICAN ABORIGINES WITH A SCHEME OF EXPLORATION OF THE RUINS IN NEW MEXICO AND ELSEWHERE. BY LEWIS H. MORGAN	29
II. ANCIENT WALLS ON MONTE LEONE, IN THE PROVINCE OF GROSSETO, ITALY. BY W. J. STILLMAN	81
III. ARCHAEOLOGICAL NOTES ON GREEK SHORES, PART I. BY JOSEPH THACHER CLARKE	93



PRELIMINARY STATEMENT AND LIST OF MEMBERS.

IN April, 1879, a circular was issued, stating that it was proposed to establish a society for the purpose of furthering and directing archæological investigation and research, and setting forth in general terms the objects contemplated and methods suggested for procedure. This circular requested the persons to whom it was addressed to join the proposed society, and was signed by

**CHARLES W. ELIOT.
ALEXANDER AGASSIZ.
W. ENDICOTT, JR.
W. W. GOODWIN.
AUGUSTUS LOWELL.
F. W. PUTNAM.**

**MARTIN BRIMMER.
T. G. APPLETON.
E. W. GURNEY.
HENRY P. KIDDER.
C. C. PERKINS.
C. E. NORTON.**

More than one hundred persons having signified their desire to become members of the society, a meeting was held at No. 50 State Street, Boston, May 10, 1879. Remarks were made by many of the gentlemen present, explaining the aims in view in the formation of such a society, and a committee

was appointed to draw up a constitution for the society. This committee consisted of

C. E. NORTON.	H. W. HAYNES.
W. W. GREENOUGH.	W. S. BIGELOW.
S. A. GREENE.	

At an adjourned meeting, held May 17, they reported the following "Regulations":—

1. The Archæological Institute of America is formed for the purpose of promoting and directing archæological investigation and research,— by the sending out of expeditions for special investigation, by aiding the efforts of independent explorers, by publication of reports of the results of the expeditions which the Institute may undertake or promote, and by any other means which may from time to time appear desirable.

2. The Archæological Institute shall consist of Life Members, being such persons as shall contribute at one time not less than \$100 to its funds, and of Annual Members, who shall contribute not less than \$10. Classes of honorary and corresponding members may be formed at the discretion of the government of the Institute, and under such regulations as it may impose.

3. The government of the Institute shall be vested in an Executive Committee, consisting of a president, a vice-president, a treasurer, a secretary, and five ordinary members.

4. The president, the vice-president, and the five ordinary members of the Executive Committee shall be chosen by the ballot of the life and annual members at the annual meeting of the Institute, and shall hold office for one year, or until their successors are chosen. They shall be eligible for re-election.

The treasurer and the secretary shall be chosen by the president, the vice-president, and the five ordinary members of the Executive Committee, and shall hold office at their pleasure.

The government of the Institute shall be empowered to fill up, *pro tempore* by election, all vacancies in its body occasioned by the death or resignation of any of its members.

5. The Executive Committee shall have full power to determine the work to be undertaken by the Institute, and the mode of its accomplishment ; to employ agents, and to expend all the funds of the Institute for the purpose for which it is formed ; but it shall not have the power to incur any debt on behalf of the Institute.

It shall make its own regulations, and determine its own methods of procedure.

The secretary shall keep a careful record of its transactions, and the committee shall submit a full written report concerning them at each annual meeting.

6. The accounts of the Institute shall be submitted annually to two auditors, who shall be elected for that purpose by the members of the Institute at the annual meeting, and who shall attest by their signatures the accuracy of the said accounts.

7. The annual meeting shall be held in Boston on the third Saturday of May, at eleven o'clock A.M.

8. Special meetings of the Institute may be called at any time at the discretion of the Executive Committee.

9. Subscriptions and donations may be paid to the treasurer or any member of the Executive Committee, and no person not a life member shall be entitled to vote at the annual meeting who has not paid his subscription for the past year. The year shall be considered as closing with the termination of the annual meeting, from which time the subscription for the ensuing year shall become due.

10. An amendment of the regulations shall require the vote of three fourths of an annual meeting.

It was then voted "that those persons present constitute themselves 'The Archæological Institute of America' under the above regulations ;" and also, "that after the number of members shall have increased to three hundred and fifty, no more shall be admitted except when elected by the Executive Committee."

The members then proceeded to ballot for officers, and the following persons, who had been nominated by a special committee, were elected:—

President CHARLES ELIOT NORTON.

Vice-President MARTIN BRIMMER.

Ordinary Members.

FRANCIS PARKMAN.

H. W. HAYNES.

ALEXANDER AGASSIZ.

W. W. GOODWIN.

WILLIAM R. WARE.

The Executive Committee held their first meeting immediately after the adjournment of the general meeting, and Mr. O. W. Peabody was chosen treasurer, and Mr. E. H. Greenleaf, secretary.

At a subsequent meeting of the Executive Committee a circular was submitted and adopted for publication, in order to make the existence and aims of the Institute more widely known. The substance of this circular was as follows:—

It is desired by the founders and existing members of the society that its lists should include associates from all parts of the country. The objects of the Institute have no narrow local interest. It hopes, by its work, to increase the knowledge of the early history of mankind, to quicken the interest in classical and Biblical studies, to promote an acquaintance with the prehistoric antiquities of our own country, and to enlarge the resources of our universities and museums by such collections of works of art and remains of antiquity as it may be enabled to make.

To perform satisfactorily even a small part of this work, large sums of money are required.

The expenses of exploration of the sites of ancient civilization in the Old World or the New are necessarily considerable.

The Institute, therefore, asks for and claims the support, not only of specialists, scholars, and men of science, but of all persons, men and women, throughout the country who take an interest in the objects it has in view.

The Executive Committee have reason for confidence that, if a sufficient sum be provided, an expedition of such character as shall be honorable to the science and scholarship of the country may be speedily organized.

They desire, consequently, to receive large accessions to the membership, especially of life members.

Any person wishing to become a life or annual member of the Institute is requested to forward his or her name and full address to the secretary (Edward H. Greenleaf, Museum of Fine Arts, Boston, Mass.), together with the sum requisite for membership, for which a receipt will be returned by the treasurer.

The following list contains the names of all members at the present date:—

LIFE MEMBERS.

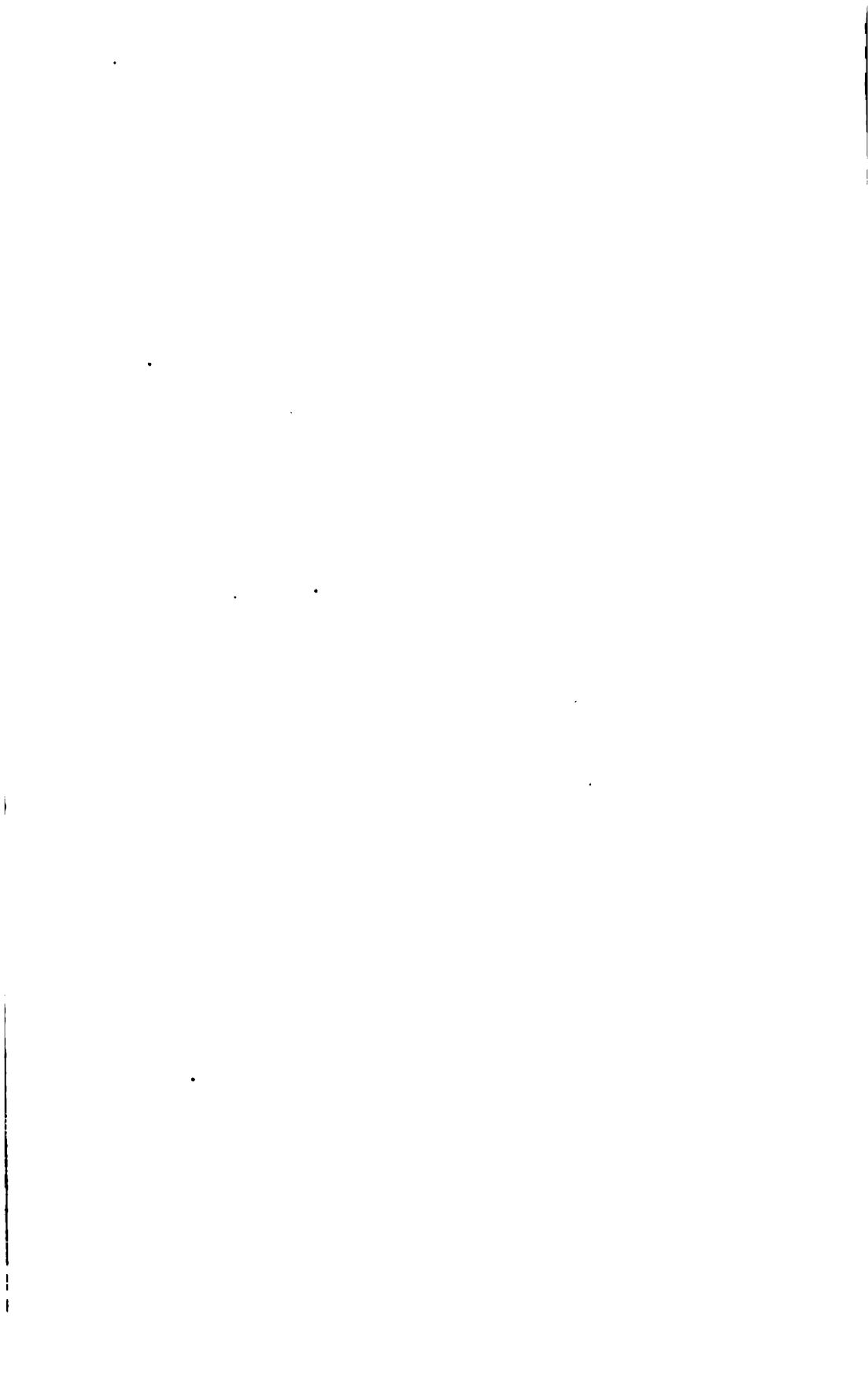
Alexander Agassiz.	Clarence B. Moore.
Charles S. Bradlee.	Otis Norcross.
George B. Chase.	Francis E. Parker.
M. F. Force.	Stephen Salisbury, Jr.
H. L. Higginson.	Quincy A. Shaw.
Miss Alice S. Hooper. ¹	Edward Spencer.
John W. McCoy.	Clement A. Walker.
D. O. Mills.	

¹ Deceased.

ANNUAL MEMBERS.

Francis E. Abbot.	Edward G. Gardiner.
William F. Allen.	D. C. Gilman.
James Barr Ames.	Edwin L. Godkin.
William Amory.	Richard H. Lawrence.
William Aspinwall.	Henry Cabot Lodge.
Gilbert Attwood.	W. P. P. Longfellow.
J. T. Bailey.	Charles G. Loring.
Ad. F. Bandelier.	Thornton K. Lothrop.
Francis Bartlett.	Augustus Lowell.
Mrs. E. H. Bigelow.	George G. Lowell.
Timothy Bigelow.	John Lowell.
William Sturgis Bigelow.	Miss Abby W. May.
Charles P. Bowditch.	Charles H. Moore.
Martin Brimmer.	Lewis H. Morgan.
William S. Bullard.	E. R. Mudge.
Elmer H. Capen.	Charles Eliot Norton.
L. P. di Cesnola.	James R. Osgood.
C. F. Choate.	Robert Treat Paine, Jr.
Samuel C. Cobb.	Francis W. Palfrey.
Benjamin R. Curtis.	Harvey D. Parker.
George William Curtis.	Francis Parkman.
C. H. Dalton.	Oliver W. Peabody.
Henry Davenport.	Charles C. Perkins.
Thomas Davidson.	J. M. Peirce.
E. S. Dixwell.	Charles L. Peirson.
Edmund Dwight.	Eleazer Franklin Pratt.
L. Dyer.	Waldo S. Pratt.
Ralph Waldo Emerson.	F. W. Putnam.
William Endicott, Jr.	Frederick H. Rindge.
Dana Estes.	William B. Rogers.
Glendower Evans.	Edward E. Salisbury.
Charles Fairchild.	Stephen Salisbury.
Miss Alice C. Fletcher.	Philip H. Sears.
John M. Forbes.	J. B. Sewall.
W. H. Forbes.	N. S. Shaler.

Mrs. G. H. Shaw.	Henry P. Kidder.
Walter Smith.	S. R. Koehler.
H. G. Spaulding.	Russell Sturgis.
W. W. Goodwin.	Richard Sullivan.
Horace Gray.	J. H. Thayer.
George Z. Gray.	S. Lothrop Thorndike.
Samuel A. Green.	Philip Valentini.
Edward H. Greenleaf.	George W. Wales.
Richard C. Greenleaf.	William R. Ware.
W. W. Greenough.	G. Washington Warren.
E. W. Gurney.	Samuel D. Warren.
Henry W. Haynes.	Edward Wheelwright.
T. W. Higginson.	John Williams White.
R. M. Hodges.	Mrs. Henry Whitman.
C. D. Homans.	George Wigglesworth.
Edward W. Hooper.	Justin Winsor.
E. N. Horsford.	Robert C. Winthrop.
H. O. Houghton.	John Woodbury.
Ernest Jackson.	Theodore D. Woolsey.
Reverdy Johnson.	



To the Members of the Archaeological Institute of America.

THE Executive Committee elected by you a year ago have the honor to present to you the first annual report of the proceedings of the Institute.

The statement preceding this report exhibits the number of life and annual members of the Institute. Your committee did not altogether regret that the comparatively small number of members assured them of but a very moderate income during the first year of the existence of the society. Deliberation was required as to the best plans for future work, and careful consideration of many projects, all of them of interest, and most of them offering promise of good results, but all involving large expenditure.

But although the funds at their disposal were small, your committee have been able, by means of them, to secure contributions to archæological science both in America and in Europe, which they trust may be regarded as a worthy beginning of the work of the Institute. These contributions appear in the papers attached to this report.

The first of them is an essay by the Honorable Lewis H. Morgan on the System of House-building practised by the Indians, and on the inferences to be drawn from it in regard to their social condition and habits of life. Mr. Morgan has so long been recognized as one of the first authorities in this country upon many points respecting the aboriginal races of this continent that your committee, shortly after the organization of the Institute, asked from him the expression of his views in regard to the most important field in America to be entered upon by the Institute, and as to the most useful direction to be given to such investigations as it might undertake. The accompanying paper embodies Mr. Morgan's answer to this application; and the recommendations of your committee, in a later part of this report, are in accordance with his suggestions.

Your committee, having learned that Mr. Joseph Thacher Clarke, of Boston, was visiting the Greek lands for the sake of studying the monuments and ruins of Doric architecture, with the object of obtaining the materials for a much-needed critical history of the Doric style, and learning further that the means at Mr. Clarke's disposal were too limited to enable him to do all that was desirable to complete his special investigation, determined to supply him with funds to assist him in his work. They regarded this work as coming legitimately within the objects of the Institute. They proposed also to

obtain from Mr. Clarke a report upon the archæological aspects of the sites visited by him. Many of these sites lie out of the usual track of travel or of trade; most of them possess features of interest to the archæologist; some of them offer promising ground for exploration. A report upon their actual condition from this point of view would be of interest. Mr. Clarke's field of study was to embrace the coast of Asia Minor, the Archipelago, Greece, Corfu, Magna Græcia, and Sicily. The commission of the Institute did not reach him till a portion of this region had already been visited, so that in regard to it he had only the notes taken for his special object to depend upon; another portion of the region is to be visited the present year; but in presenting his "Archæological Notes on Greek Shores, Part I.," as the second paper in this volume, your committee have pleasure in the conviction that these Notes constitute a substantial addition to knowledge respecting the matters which they treat.

In the summer of 1877 Mr. R. P. Pullan published, in the London "Academy," a letter giving an account of some remarkable and hitherto undescribed ancient walls in the province of Grosseto in Italy, on a height called Monte Leone. The walls were very extensive, and Mr. Pullan estimated them as at least ten miles in circuit. In an appendix to the Introduction to the second edition of his "Cities and Cemeteries of Etruria," published in 1878, Mr. Dennis gives an account, derived from Mr. Pullan,

of this "ancient city," as he terms it, concluding with the words, "As attention has now been directed to this extensive inclosure, . . . its character and antiquity cannot long remain a mystery." It seemed to your committee that it would be well to attempt to gain some more complete and accurate information in regard to these walls than that afforded by Mr. Pullan, even if it should prove impossible to solve the enigma of their character and antiquity. With this view they were glad to be able to enlist the services of Mr. W. J. Stillman, who is now resident in Florence, and who for many years has made a study of the so-called Pelasgic and Cyclopean walls in Italy and elsewhere, peculiarly fitting him for such an investigation as was required. It is with great satisfaction that your committee publish his interesting report, which strikingly confirms the opinion that there is a wealth of antiquity still to be discovered in Italy. "I am persuaded," says Mr. Dennis,—and there is no man living whose opinion on this subject is of greater weight,—"I am persuaded that Italy is not yet half explored; that very much yet remains to be brought to light,—a persuasion founded upon such discoveries as this."¹

Such has been the work of the past year. The work to be prosecuted during the coming year must depend in great measure upon the means provided for it by the members of the Institute, and by con-

¹ "Cities and Cemeteries of Etruria," second edition, 1878, vol. I. p. 183. Mr. Dennis is speaking of discoveries at Castel d'Asso.

tributions of individuals interested in archæological studies. Relying upon being supplied with what may be required for undertakings worthy of the design with which the Institute was founded, your committee have carefully laid out a scheme of operations, both in our own country and in the Old World, which they proceed to lay before you.

Considering the recent origin of a true science of archæology, and the even yet imperfect exploration of considerable portions of this continent, it is not surprising that a comprehensive survey of the antiquities of America and a scientific classification of them are still lacking. Many questions in regard to their origin, relations, and the inferences that may legitimately be drawn from them concerning the native race, of whom they are the only monuments, remain still unsolved. The remains of the works of the former inhabitants of the continent, with the exception of those in Mexico, Central America, and Peru, had, till within late years, excited comparatively little curiosity, and had nowhere been thoroughly investigated in a scientific spirit. The first treatise of importance on the antiquities of the United States was that of Squier and Davis, on "The Ancient Monuments of the Mississippi Valley," issued by the Smithsonian Institution in 1848. Since that time the work of investigation and exploration has been more or less steadily carried on, over a constantly widening extent of territory, by members of the Government Surveys, by persons employed by

the Smithsonian Institution, and more recently, by the Peabody Museum of American Archæology and Ethnology at Cambridge, and by numerous independent individuals. Information on the subject has rapidly increased. A vast body of facts has been accumulated, and large and valuable collections of objects, from mounds, graves, villages, and pueblos, in different parts of the United States have been brought together. Probably little of essential importance in respect to the character of the remains of aboriginal life lies undiscovered. We have already at hand the needed material for the illustration of the modes of life of the native races, and for the determination of the various stages of civilization to which they attained; but for the proper understanding and use of this mass of material much preliminary labor is still required.

The study of American archæology relates, indeed, to the monuments of a race that never attained to a high degree of civilization, and that has left no trustworthy records of continuous history. It was a race whose intelligence was for the most part of a low order, whose sentiments and emotions were confined within a narrow range, and whose imagination was never quickened to find expression for itself in poetic or artistic forms of beauty. From what it was or what it did nothing is to be learned that has any direct bearing on the progress of civilization. Such interest as attaches to it is that which it possesses in common with other early and undeveloped

races of mankind. Our knowledge of the primitive conditions of man, and of the first steps in his advance out of savage conditions, is still imperfect; and the study of the aboriginal life in America is essential to complete the history of the human race, as well as to gratify a legitimate curiosity concerning the condition of man on this continent previous to its discovery four hundred years ago. It may yet be possible to ascertain if there were remote affinities between the races of the Old World and the New, and we may expect with confidence to obtain, by means of properly directed inquiries, knowledge more definite than we now possess concerning the consanguinity, the historic relations, and the migrations of the people of the two divisions of the continent.

In view of what has been done and is now doing by the Government, the Smithsonian Institution, and the Peabody Museum in the direct investigation of the ancient monuments of the country, your committee believe that the work in America in which the Archæological Institute should at first engage is that of the study of the actual life and customs of those Indian tribes which still occupy the seats of ancient habitancy, and exist as representatives of the builders of mounds and the dwellers in cave-houses and fortified villages. The investigation of their modes of life, their traditions, their intellectual and moral conceptions, is of prime importance for the light it may throw on the history and conditions of

their predecessors, and of the kindred though more advanced tribes of Mexico: it is an indispensable accessory to the study of the monuments of earlier times. The opportunity for this investigation is rapidly passing away; in the course of a very few years, with the extension of the railway system, which has already penetrated the regions inhabited by these tribes, and with the completer occupation of the land by our own race, it will have disappeared. The territory where the investigation may now be most profitably carried on lies within the boundaries of Colorado and New Mexico. A scientific study of the life of the Indians of this part of the country is the surest method for the determination of many unsolved questions concerning the archæology of the continent.

Your committee have, accordingly, taken steps to prepare for sending out to Colorado and New Mexico an agent properly qualified, by character and education, for the study of the life of the village Indians in this region.

The cost of maintaining, for such time as may be required for the satisfactory performance of the work, an expedition consisting of a chief and his assistant, and of providing it with all necessary means for such special investigations as may be desirable, they estimate at not far from four thousand dollars.

While the archæology of America offers many instructive analogies with the prehistoric archæology

of the Old World, it affords nothing to compare with the historic archæology of civilized man in Africa, Asia, and Europe. The study of the course of ancient civilization, as revealed in its monuments, must be pursued mainly in the lands whose borders form the eastern shores of the Mediterranean. Much as has been done in recent times for the exploration of these regions, and splendid as have been the results achieved, far more remains to be done. Many sites of high culture, centres of power and wealth for long periods, ruined by the blows of adverse fortune, till scarcely more was left of them than their names and a faint memory of former greatness, have been in late centuries almost unvisited and wholly unexplored. The success that has attended the explorations of Dr. Schliemann, General di Cesnola, and the Germans at Olympia and Pergamon, beside making a magnificent addition to our knowledge of classical history and art, is of the best promise as indicating that important, if less brilliant, discoveries await the intelligent investigators of other sites. The hill of Troy is not the only hill to yield a harvest—*seges ubi Troja fuit*—nor was Crete less rich or less famous for arts than Cyprus.

Every new discovery, even if apparently of slight moment, adds precision to our knowledge of a past, the relations of which to the present draw closer as time goes on, and become more significant as that past becomes better and better understood. This is especially the case with respect to Greece. The

influence of the Greek intelligence upon thought has vastly increased during the present century, and this is in large measure due to the actual increase of knowledge by discovery. The mastery of the Greek in every field of intellectual expression is acknowledged now as it was acknowledged by their conquerors. The *vivida vis animi* of the Greek still gains the day as of old. The higher the reach of modern effort, the plainer becomes the pre-eminence of the race that established the direction in which civilization is still proceeding, and advanced along many paths to a point beyond which their successors have not gone.

The conditions of American life, separating us in great measure from direct acquaintance with the works of past times, and breaking for us many of the threads of tradition and association by which the successive generations of men are bound one to another, interfere with the influence of many of the most powerful stimulants of the intelligence and the imagination, and tend to beget indifference to one of the chief sources of culture. The same barbaric spirit that asks, "What have we to do with abroad?" asks also, "What have we to do with antiquity?"

The existence of this spirit is not surprising, in view of the comparative neglect among us of ancient studies, and especially of those relating to the archæology of Greece, in which is comprised the study of the origin and development of those arts which gave just expression to the Greek intel-

ligence and sentiment, and afford such an image of national life and character as no other people has ever left of itself in its works. No regular instruction in this fruitful field of study is provided at any of our universities, although to encourage the cultivation of it, as the introduction to a knowledge of the life and the history of the Greek race, might well be regarded as among the chief aims of an enlightened scheme of education.

The promotion of this study is one of the objects of our organization. In order that it may engage in the work of investigation and exploration of the antiquities of Greece with good hope of making a valuable contribution to knowledge, and of quickening and deepening the interest in the subject, it has been the duty of your committee to consider the various sites which offered promise of good results to the explorer. They have carefully surveyed the ground, and have had the invaluable assistance, in forming a judgment, of the suggestions and advice of the illustrious scholar, Professor Ernst Curtius.

They have selected a site for exploration where they have every confidence that discoveries of interest may be made, and they are prepared to begin work upon it so soon as the members of the Institute or the public at large will supply them with the requisite means. For the next year the committee desire for this purpose a sum of not less than eight thousand dollars. It does not seem to them desirable to state in full the nature of their plans, or even to

name the site they have chosen, lest complications which might interfere with the carrying out of their designs should arise through publicity; but they will communicate fully upon the matter with any member of the Institute who may desire further information than is here given.

Your committee hope that the work which they propose may be effectively supported, not merely for the sake of its influence on the progress of Greek studies, but also for the sake of the contributions it may make to the resources of our museums and universities. Such objects of ancient art as we may be fortunate enough to secure in the Old World would increase the collections of the Boston Museum of Fine Arts, or the select collection for purposes of instruction in Harvard College, or the collections of institutions in other cities,—such as the Metropolitan Museum of New York, or the Art Gallery of New Haven, in case the respective trustees of these institutions, or individuals interested in them, should contribute efficiently to the undertakings in which the Institute may engage. Such American antiquities as the expedition of the Institute may obtain would find their proper place in the Peabody Museum at Cambridge.

One method by which the objects of the Institute might be most serviceably promoted, and which your committee earnestly recommend, would be the establishment of scholarships of archæology at Harvard, Yale, Columbia, and other colleges. Two

foundations, of from six hundred to one thousand dollars a year, to be awarded by the authorities of the respective universities to two competent young graduates, to be held by them for two or three years, while one of them should pursue the study of American, and the other of classical archæology, would be the means not only of quickening interest in these pursuits among the students, but of training a succession of scholars who might be expected to advance the science to which they were devoted. During the last year a travelling studentship in archæology has been established at Oxford through the generosity of an anonymous benefactor. Your committee trust that this example may be speedily followed here.

France and Germany have their schools at Athens, where young scholars devote themselves, under the guidance of eminent masters, to studies and research in archæology. The results that have followed from this training have been excellent; and it is greatly to be desired, for the sake of American scholarship, that a similar American school may before long enter into honorable rivalry with those already established.

The success of the Institute in the work it has undertaken depends upon the pecuniary support it may receive from its members and from the public. The number of members ought to be greatly increased. A thousand members would be but a comparatively small number to be supplied by the

interest of the intelligent part of the national community in the work which the Institute has in hand; two thousand members would give to it ample funds for the successful prosecution of tasks of the highest interest. Your committee appeal to each member of the Institute to do whatever may lie in his power to increase the membership, and to the public at large for that generous support which it is ever ready to give to efforts to extend the boundaries of knowledge and to raise the standard of education.

CHARLES ELIOT NORTON, *President.*
MARTIN BRIMMER, *Vice-President.*
FRANCIS PARKMAN.
H. W. HAYNES.
W. R. WARE.
W. W. GOODWIN.
ALEXANDER AGASSIZ.
O. W. PEABODY, *Treasurer.*
E. H. GREENLEAF, *Secretary.*

Executive Committee.

A STUDY
OF THE
HOUSES OF THE AMERICAN ABORIGINES;
WITH SUGGESTIONS FOR THE EXPLORATION OF THE
RUINS IN NEW MEXICO, ARIZONA, THE VALLEY OF THE
SAN JUAN, AND IN YUCATAN AND
CENTRAL AMERICA,
UNDER THE AUSPICES OF THE ARCHAEOLOGICAL INSTITUTE.
By LEWIS H. MORGAN.



A STUDY
OF THE
HOUSES OF THE AMERICAN ABORIGINES.

ONE great object of the Archæological Institute, so far as it relates to America, should be to explore, delineate, and describe the house architecture of the Indian tribes as represented by the houses now to be found in ruins, or in actual occupation, in the region of the San Juan River, in New Mexico and Arizona, in Mexico and Central America, and to study such fictile wares, implements, and utensils as may be found therein, and may tend to illustrate the condition of the people. The whole of this area should be covered by the plan of operations of the Institute, for it contains but one system of works, similar in broad features, but with minor, mutually illustrative varieties in different localities. To the Archæological Institute pre-eminently belongs the important and meritorious enterprise of gathering up a knowledge of these remains, and of presenting to the world a comparison and interpretation of them. There is yet time to do this work well: it cannot be done by any single individual; and unless the present organization succeed in its accomplishment, there is little hope that it will ever be done.

The great houses of stone of the Village Indians within the areas named, and particularly in Yucatan and Central America, are the highest constructive works of the Indian tribes. It seems to me probable that, from the beginning, a wrong interpretation has been put upon this architecture,

from a failure to understand its object and uses, and the condition and mode of domestic life of the people who occupied these structures. The design and object for which these edifices were constructed still await an intelligent explanation.

There are reasons for assuming that all the tribes of the American aborigines were of one common stock; that their institutions, plan of life, usages and customs were similar; and that the houses in ruins in the various places named can be explained, by comparison with those now inhabited in New Mexico, as parts of a common system of house architecture. If this be so, it follows that the facts of American archæology must be studied ethnologically; *i. e.*, from the institutions, usages, and mode of life of existing Indian tribes. It is by losing sight of this principle that American archæology is in such a low condition, or rather that we scarcely have such a science among us.

I will endeavor to illustrate this proposition with some degree of fulness, because of its important bearing upon the question of future explorations by the Institute.

I. It is made plain, by a bare inspection of the ground plans of Indian houses that a common principle — that of adaptation to communism in living — runs through all the house architecture of our Indian tribes, and that this principle determined the form and character of the house itself. It is seen in the Long Houses of the Iroquois prior to A. D. 1750, designed for five, ten, and twenty families; in the lodges of the Minnitares and Mandans, designed for six and eight families; in the spacious houses of the Columbia River Indians, visited by Lewis and Clarke in 1805, large enough for several families, and in some cases containing two hundred or more persons; and in the clustered cabins of the Creeks and Cherokees, designed for several families. This communism appears to have been restricted to the household.

Mr. Greenhalgh, who visited the several villages of the Iroquois in 1677, thus describes Tiotohattan, the largest of the Seneca villages, situated near Mendon, in the county of Monroe, New York: "It contains about one hundred and twenty houses, being the largest of all the houses we saw, the ordinary being fifty to sixty feet long, with twelve and thirteen fires in one house. They have a good store of corn growing about a mile to the northward of the town."¹ We know the form and mode of construction of these houses from Seneca Indians who had lived in them in their childhood.



FIG. 1. GROUND PLAN OF SENECA-IROQUOIS LONG HOUSE.

The interior of the house was divided into compartments at intervals of six or eight feet, leaving each chamber entirely open, like a stall, upon the passage-way or hall, which ran through the centre of the house, from end to end. Between each four apartments, two on a side, was a fire-pit in the centre of the hall, used in common by their occupants. Thus a house with six fires would contain twenty-four apartments, and would accommodate as many families, unless some of the apartments were reserved for storage-rooms. Raised bunks were constructed around the three sides of each stall for beds, and the floor was slightly raised above the level of the ground. From the roof-poles were suspended strings of maize in the ear, braided together by the husk; also, strings of dried squash and dried meat. Each house, as a rule, was occupied by related families, the mothers being sisters, own and collateral, who with their children belonged to the same *gens* or clan, while their husbands, the fathers of these children, belonged to

¹ Documentary History of New York, 1, 13.

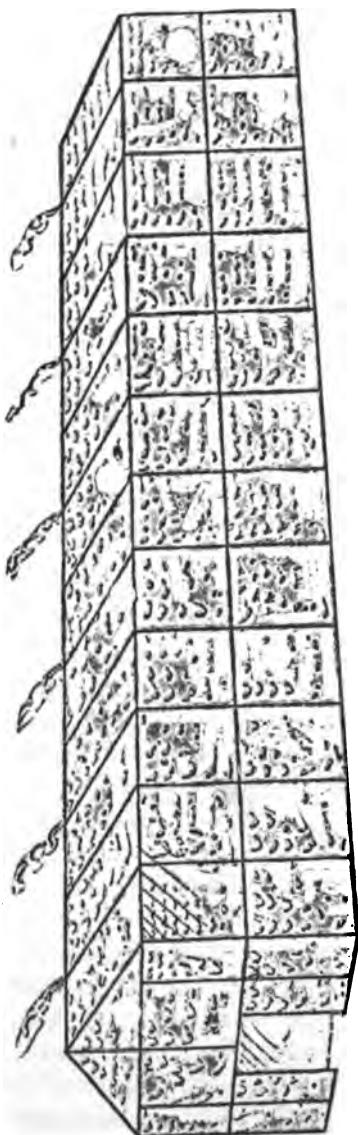


FIG. 2. ELEVATION OF SAME.

Having found it in one stock as well developed as the

other *gentes*; consequently, the *gens* or clan of the mother predominated in numbers in the household, descent being in the female line. Whatever was taken in the hunt, or raised by cultivation by any member of the household, was for the common benefit. Provisions were held as common stock within the household. The Iroquois had but one cooked meal each day,—a dinner. Each household, in the matter of the management of their food, was under the care of a matron. When the daily meal had been cooked at the several fires, the matron was summoned. It was her duty to divide the food from the kettle to the several families within the house, according to their needs. What remained was put aside to await the further direction of the matron.

Here, then, was communism in living, carried out in practical life and with a method, but limited to the household, and with an expression of the principle in the plan of the house itself.

Iroquois, we may expect to find it generally among those Indian tribes which were in the same stage of advancement, and to trace it in a modified form among the more advanced sedentary Village Indians of New Mexico, Mexico, and Central America. It is seen to be a law of their condition, and the most economical mode of life open to them.

The Long House was from fifty to eighty, and sometimes a hundred feet long. It was constructed with a strong frame of upright poles set in the ground, strengthened by horizontal poles attached with withes, and surmounted by a triangular or sometimes a round-top roof. The sides, ends, and roof were covered with large strips of elm-bark which were tied to the frame with strings, or fastened with splints. An external frame of poles was then set up, so as to hold the bark shingles between it and the inner frame, the two frames being tied together with withes or strings. A suspended skin at either end answered for a door.

The Iroquois Long House disappeared before the commencement of the present century, and with it the practice among the Iroquois of communism in living. They have adopted the customs of our people, and live in separate houses or cabins, each family by itself. Very little is now remembered by these Indians themselves of their ancient plan of life in the communal houses, and few, if any, now survive who lived in them in childhood. Mrs. William Parker, a Seneca woman, of Tonawanda, informed me, thirty years ago, that when she was a child she lived in one of these houses, and that her mother and grandmother before her had acted as matrons in one of these Long Houses. At the same time her husband constructed for the writer a model of one of these houses, showing the manner of their construction. The more intelligent Seneca Indians were then familiar with the plan.

In 1696 the Onondagas burned their village at Onondaga,

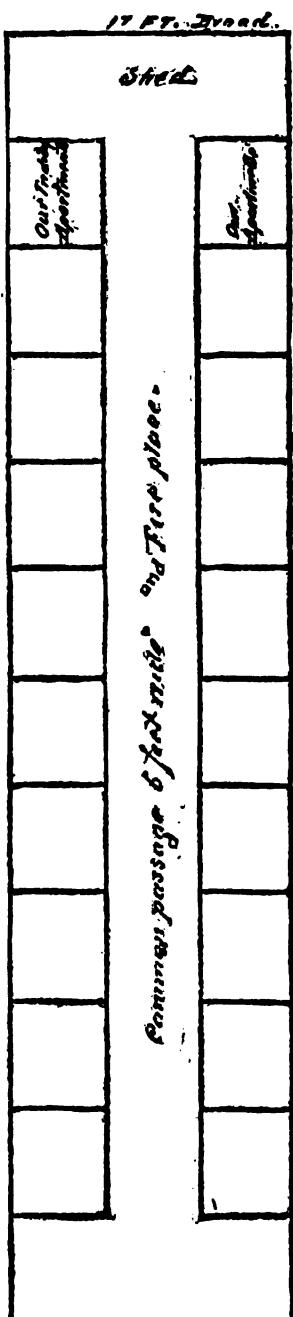


Fig. 3. BARTRAM'S GROUND PLAN OF ONONDAGA-IROQUOIS HOUSE IN 1743.

at the time of the French invasion under Frontenac. A new village was afterward built near or upon the old site. In 1743 Mr. Bartram, in company with Conrad Weiser, visited the Onondagas to attend a council, and afterwards published his Journal. This contained a ground plan of the Long House in which they were lodged and entertained by the Onondaga chiefs. The plan here given is an exact copy of that in his book. It was the largest of all the houses in the village, and used as the "Official House" of the tribe, though called the "Council House" by Mr. Bartram. "We alighted," he remarks, "at the Council House, where the chiefs were already assembled to receive us, which they did with a grave, cheerful complaisance, according to their custom. They showed us where to lay our luggage and repose ourselves during our stay with them, which was in the two end-apartments of this large house. The Indians that came with

us were placed over against us. This cabin is about eighty feet long and seventeen broad, the common passage six feet wide, and the apartments on each side five feet, raised a foot above the passage by a long sapling, hewed square, and fitted with joists that go from it to the back of the house. On these joists they lay large pieces of bark, and on extraordinary occasions spread mats made of rushes, which favor

we had. On these floors they sit or lie down, every one as he will. The apartments are divided from each other by boards or bark, six or seven feet long from the lower floor to the upper, on which they put their lumber. . . . All the sides and roof of the cabin are made of bark, bound first to poles set in the ground, and bent round on the top, or set aflat for the roof as we set our rafters. Over each fireplace they leave a hole to let out the smoke, which in rainy weather they cover with a piece of bark; and this they can easily reach with a pole to perch it on one side or quite cover the hole. After this manner are most of their houses built."¹ The end section shows a round roof, as in the houses of the Virginia Indians, and the ground plan agrees, in all essential respects, with the old Long Houses of the Senecas as described by them to the writer.

Among the Minnitaires of the upper Missouri a style of timber-framed house was found, covered with earth, superior in construction to that of the Iroquois, but agreeing with it in its communal character. It was not confined to the Minnitaires, but was constructed by the Mandans also; and, at a later day, by the Arickarees, Iowas, and Omahas.

¹ Bartram's Observations, etc. Travel to Onondaga. 2d ed. 1751, pp. 40, 41.

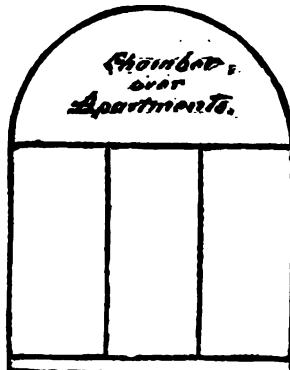


FIG. 3. CROSS SECTION.

The Minnitares and Mandans now live together at one village at Fort Berthold, in houses of this kind, and the Arickarees near them, in houses of the same description, constructed as late as 1861. This is the most elaborate house constructed by any of the northern tribes. There is some reason, growing out of their peculiar religious system, for the conjecture that the Minnitares are descendants of the Mound Builders, from whom they derived the practice of cord-swinging and of dragging the buffalo-skull, and other acts of self-torture, fully described in his book, entitled "O-kee-pa," by George Catlin, who witnessed, among the Mandans, in 1832, these extraordinary rites, which they had adopted from the Minnitares.¹

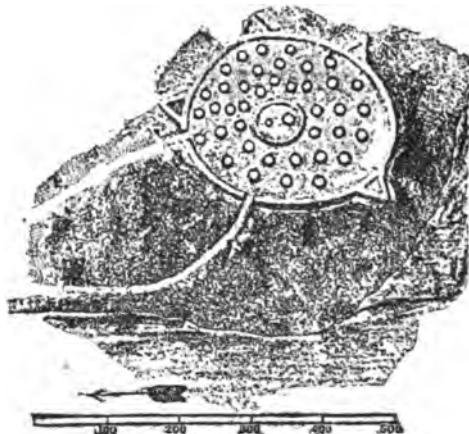


FIG. 4. MANDAN VILLAGE PLOT.

In 1862 I saw the remains of the old Mandan village, shortly after its abandonment by the Arickarees, its last occupants. The houses, nearly all of which were of the same model, were falling into decay, but some of them were still perfect, and the plan of their structure could be easily made out.

¹ O-kee-pa. A Religious Ceremony and Other Customs of the Mandans, 1867.

The preceding cut of the village is taken from the work of Prince Maximilian of Wied-Neuwied, and the remaining illustrations are from sketches and measurements of the writer. It was situated upon a bluff on the west side of the Missouri, and at a bend in the river which formed an obtuse angle and covered about six acres of land. The village was surrounded with a stockade, made of timbers set vertically in the ground, and about ten feet high, but then in a dilapidated condition.

The houses were circular in external form, the walls being about five feet high, sloping inward from the ground. An inclined roof rested upon the walls. Both the roof and the exterior walls were covered with "a concrete of tough clay and gravel," a foot and a half thick. For this reason the houses have usually been called "Dirt Lodges."

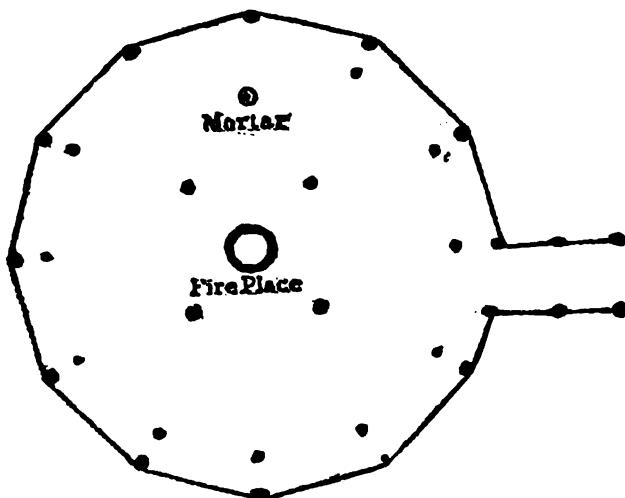


FIG. 5. GROUND PLAN OF MANDAN HOUSE.

The houses were about forty feet in diameter, with the floor sunk a foot below the surface of the ground. They were six feet high on the inside at the line of the wall, and from twelve to fifteen feet high at the centre. Twelve

posts, about six inches in diameter, were set in the ground, at equal distances on the circumference of a circle, and rose about six feet above the level of the floor; string pieces, resting in forks cut in the end of these posts, formed a polygon at the top, and also upon the ground floor. Against these posts an equal number of braces were sunk in the ground, about four feet distant, which, slanting upward, were braced against the stringers. Slabs of wood were then set in the spaces between the braces, at the same inclination, and resting against the stringers, so as, when complete, to surround the lodge with a wooden wall. Four round posts were set in the ground near the centre of the floor in the angles of a square. These were ten feet apart, and rose from ten to fifteen feet above the ground floor. They were connected by stringers resting in forks at their tops, upon which, and the external wall, the rafters rest.

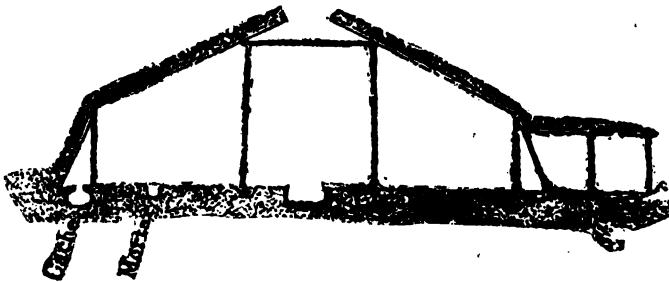


FIG. 6. CROSS SECTION OF HOUSE.

Poles three or four inches in diameter were laid as rafters from the external wall to the string pieces resting on the central posts, and near enough together to give the necessary strength to bear the earth-covering placed upon the roof. These poles were first covered over with willow matting, upon which prairie grass was spread, and over all a deep covering of earth, clay, and gravel. An opening was left in the centre, about four feet in diameter, for the exit of the smoke and also for the admission of light. The

interior was spacious and well-lighted for an Indian house, although the opening in the roof and a single doorway were the only apertures through which light could enter. The entrance was in the nature of an Eskimo's doorway. It was a passage some five feet wide, twelve feet long, and six feet high, constructed with split timbers, roofed with poles and covered with earth. Buffalo robes suspended at the outer and inner ends supplied the placeof doors.

Each house was divided into compartments by screens of willow matting or unhaired skins suspended from the rafters, with spaces between for stowage. These slightly constructed apartments opened towards the fire in the centre, like stalls, thus defining an open central space around the fire-pit, which was the gathering place of the inmates of the lodge. The interior was finished with a

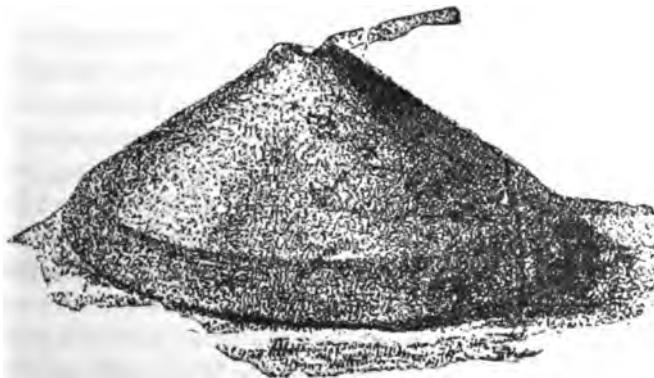


FIG. 7. MANDAN HOUSE.

hard, smooth, earthen floor. Such a lodge would accommodate five or six families, numbering in all thirty or forty persons. It was a communal house, in accordance with the usages and customs of the Indian tribes, and growing naturally out of their institutions and mode of life. The Mandans were organized in *gentes*, with descent in the female line; and doubtless each house was filled with per-

FIG. 7^a. MANDAN SCAFFOLD.

sons of the same *gens* or clan. I counted forty-eight houses which would average forty feet in diameter, all constructed on this model, besides several rectangular houses of hewn logs, evidently of later erection. These houses, of which a representation is given in Figure 7, were set thickly together to economize the space within the stockade, so that in walking through the village you passed along semi-circular footpaths. There was no street, and it was impossible to see in any direction except for short distances. In the centre was an open space, where religious rites, dances, and festivals were celebrated in the presence of spectators who occupied the tops of the lodges nearest the centre. In the spaces between the lodges were drying scaffolds, one for each lodge, which were nearly as conspicuous in the distance as the houses. They were about twenty feet long, ten feet wide, and seven feet high to the flooring. The end and middle parts were surmounted by cross pieces raised about six feet higher. These scaffolds, which were reached by ladders, were used for drying meat, skins, and vegetables. Situated pictur-
esquely upon a bluff, the houses, from their peculiar model, and the array of scaffolds rising up among them, presented a striking appearance to those who approached by the river.

Afterwards, at the present Minnitare and Mandan village, about sixty-five miles above on the east side of the river, and also at the new Arickaree village on the west side, I had an opportunity to see, in actual occupation, houses precisely similar in their interior arrangements to those described, as well as the large cultivated garden by the

side of the village, and to observe the mode of life of the Indians.

Although in form and construction unlike the Long House of the Iroquois, we yet find here a communal joint tenement-house, designed to be occupied by a large household, composed of related families. It was the same in principle as the Iroquois Long House.

When Lewis and Clarke visited the Columbia River Indian tribes in 1805-06, they found them living in houses of the plainest communal type, some of them approaching in dimensions and in the number of their occupants the Pueblo houses in New Mexico. They speak of a house of the Chopunish (Nez Percés) as follows: "The village of Tumachemootool is in fact only a single house, one hundred and fifty feet long, built after the Chopunish fashion, with sticks, straw, and dried grass. It contains twenty-four fires, about double that number of families, and might perhaps muster a hundred fighting men."¹ This would give five hundred people in a single house. The number of fires probably indicated the number of groups practising communism among themselves as household groups; though, for aught we know, it may have been general in the entire household.

Another great house (Fig. 8) is thus described: "This large house is two hundred and twenty-six feet in front, entirely above ground, and may be considered a single house, because the whole is under one roof; otherwise it would seem more like a range of buildings, as it is divided into seven distinct apartments, each thirty feet square, by means of broad boards set up on end from the floor to the roof. The apartments are separated from each other by a passage or alley, four feet wide, extending through the whole depth of the house, and the only entrance is from the alley through a small hole, about twenty inches wide and not more than three feet high. The roof is formed of

¹ Travels to the Sources of the Missouri River, etc. London ed. 1814, p. 548.

rafters and round poles laid on horizontally. The whole is covered with a double roof of bark of white cedar."¹ The apartments may be supposed to indicate the number of households into which the people were divided for the practice of communism. The houses of all the tribes visited by Lewis and Clarke were of the same general character, and designed to accommodate several families.

With respect to communism in living among these tribes, they make the following statement: "Their houses usually contain several families, consisting of the parents, their sons and daughters-in law, and grandchildren, *among whom the provision is common*, and whose harmony is scarcely ever interrupted by disputes. Although polygamy is permitted by their customs, very few have more than a single wife, and she is brought immediately after the marriage into the husband's family, where she resides until increasing numbers oblige them to seek another house. In this state, the old man is not considered the head of the family, since the active duties, as well as the responsibility, fall on some of the younger members."²

It is evident, from several statements of Catlin, that the Mandans practised communism in the household; and it is also probable that the household was formed of gentile kindred, as among the Iroquois. He also states that they kept a public store or granary to afford supplies to the whole community in time of scarcity.³

Mr. Caleb Swan, who visited the Creek Indians of Georgia in 1790, found the people living in small houses or cabins, built in clusters, each cluster being occupied by a part of a *gens* or clan. He remarks that "the smallest of their towns have from ten to forty houses, and some of the largest from fifty to two hundred, that are tolerably compact. These houses stand in clusters of four, five, six,

¹ Lewis and Clarke's Travels, etc., p. 503.

² Ib., p. 443.

³ Catlin's American Indians I., 139.

seven, and eight together. Each cluster of houses contains a clan or family of relations who eat and live in common."¹

Thus it appears that the tribes of the United States were originally found living very generally, not in single families, but in large households, composed of several families, and practising communism in living in the household. This practice revealed itself in the structure of their houses. A little reflection must convince any one of the economic advantages of this practice to people in their condition.

II. The same principle is to be traced through the joint tenement-houses of the Sedentary Village Indians of New Mexico, Arizona, Mexico, and Central America; namely, that of adaptation to communism in living in household groups, with a superadded defensive principle in the mode of construction. In New Mexico the Indians erected their houses of adobe brick, of cobble-stone and adobe mortar, and later of sandstone and the same mortar. The stones used were small in size, and presented faces of natural fracture. They were built two, three, four, and sometimes five and six stories high, with walls from two to three feet thick, in the terraced form, the upper stories receding from those below. These houses were closed up solid in the first or ground story, and were entered by means of ladders ascending to the first terrace or roof, and so to those above; the rooms being entered through trap-doors in the floors, and the descent being effected by ladders. This method of construction turned each house into a fortress.

The Village Indians were one ethnical period in advance of the northern tribes, namely, in the middle status of barbarism. Beside constructing houses of adobe brick and of stone, they cultivated garden beds by irrigation, and wore mantles of cotton, as well as skin garments,—as Coronado, who captured the principal Pueblos in New Mexico,

¹ Schoolcraft's *History, Condition and Prospects of Indian Tribes*, p. 262.

in 1540-42, states in his Relation.¹ But in the art of war the Village Indians had made but little advance beyond the tribes in the lower status. It is a question whether they were not inferior in hardihood and in courage; but they had learned to construct their houses in such a manner as to resist assault. The defensive principle incorporated in their house-architecture represented the real progress in their condition. At the same time, the fact that every house had to be constructed like a fortress indicates the insecurity in which they lived.

There is something striking and remarkable in the plan of these houses. They contained from fifty to five hundred apartments, and would accommodate from two hundred to five hundred, and in some cases more than a thousand persons. They were joint-tenement houses of the American model. They belong to a state of society that precedes advanced civilization by an immense period of time,—a condition that has never been satisfactorily studied or explained, and which it is now difficult to comprehend. Theoretically, the Pueblo house about to be described is the same in principle as the Long House of the Iroquois and the Dirt Lodge of the Mandans, but on a larger scale and in a more durable form. It presupposes a state of the family without the exclusiveness of monogamy, in which communism in living might be expected to exist as a necessary principle of economy, and to express itself in the form of the house. The house is adapted to communism in living among large groups of related persons.

It is doubtful whether it is now possible to ascertain the usages and customs of the Indians of three hundred and fifty years ago, when this mode of life was in full vitality in New Mexico, Mexico, and Central America, as

¹ "They have no cotton wool growing, because the country is cold, yet they wear mantles thereof, as your Honor may see by the show thereof [specimens must have been sent with the Relation]; and true it is that there was found in their houses cotton yarn made of cotton wool."—*Hakluyt's Collection of Voyages*. London ed., 1608. III. 377.

a natural outgrowth of Indian institutions. No attempt has been made to investigate the subject. The people have been environed with civilization during the latter portion of this period, and have been more or less affected by it. Their further growth and development was arrested by the advent of European civilization, which blighted their more feeble culture. Since their discovery they have steadily declined in numbers, and they show no signs of recovery from the shock produced by their subjugation.

Among the northern tribes—who were, as has been stated, one ethnical period below the Pueblo Indians—social organization and mode of life have changed materially, under similar influences, since the period of discovery. The family has fallen more into the strictly monogamic form. Each family now occupies a separate house. Communism in living in large households has disappeared. The organization into *gentes* has in many cases been given up, or has been rudely extinguished by external influences; and the religious usages of the tribes have also greatly changed. We must expect to find similar and even greater changes among the Village Indians of the south. The white race came upon them in Mexico and New Mexico a hundred years earlier than upon the Indian tribes of the United States. But, as if to stimulate investigation into their ancient mode of life, some of these tribes have continued through all these years to live in the identical houses occupied by their forefathers in 1540,—as at Zufí, Acoma, Jemes, and Taos. These Pueblos were contemporary with the Pueblo of Mexico captured by Cortez in 1520. The present inhabitants are likely to have retained some part of the old plan of life, or some traditional knowledge of what it was. They probably retain some of the old usages and customs with respect to the ownership and inheritance of sections of their joint-tenement houses, and to the limitations upon the power of sale, so that they should not pass out of the

kinship, as well as with respect to sections of the village garden.¹ All the facts relating to their ancient usages and mode of life should be ascertained, so far as it is now possible to do so, from the present inhabitants of these Pueblos. The information thus gained will serve a useful purpose in explaining the Pueblos in ruins in Yucatan and Central America, as well as on the San Juan, the Chaco, and the Gila. From Zufñ to Cuzco, at the time of the Spanish conquest, the mode of domestic life in all these joint tenement-houses must have been substantially the same.

The Village Indians of New Mexico, alone among the Indian tribes of America, are now, as I have said, in possession of the houses occupied by their ancestors in 1540. What has survived of the ancient manner of life is now exhibited by them alone.

Several large Pueblos of stone, now in ruins, may still be seen in the cañon of the Rio Chaco, an affluent of the San Juan. They were first described with ground plans by Lieutenant J. H. Simpson in 1849, and again by W. H. Jackson in 1876. The representation given here (Fig. 9) is from Lieutenant Simpson's Report. There are reasons for the belief that these Pueblos are the ruins of the "Seven Cities of Cibola,"² against which the expedition of Coronado was directed in 1540. They are the most remarkable ruins in New Mexico, because of their size and of the materials used in their construction. With certain stone Pueblos in ruins on the Animas River, and in the Montezuma valley, so called, they seem to have been the finest structures north of Yucatan, and the largest ever erected by the Indians in North America. There is no reason for supposing that the Pueblo of Mexico contained

¹ I saw at Taos in New Mexico in 1878, a dozen large ovens each of which was equal to the wants of several families. These were adopted from the Spanish conquerors, and yet not unlikely have some connection with the old principle of communism.

² North American Review for July, 1869,—"The Seven Cities of Cibola."

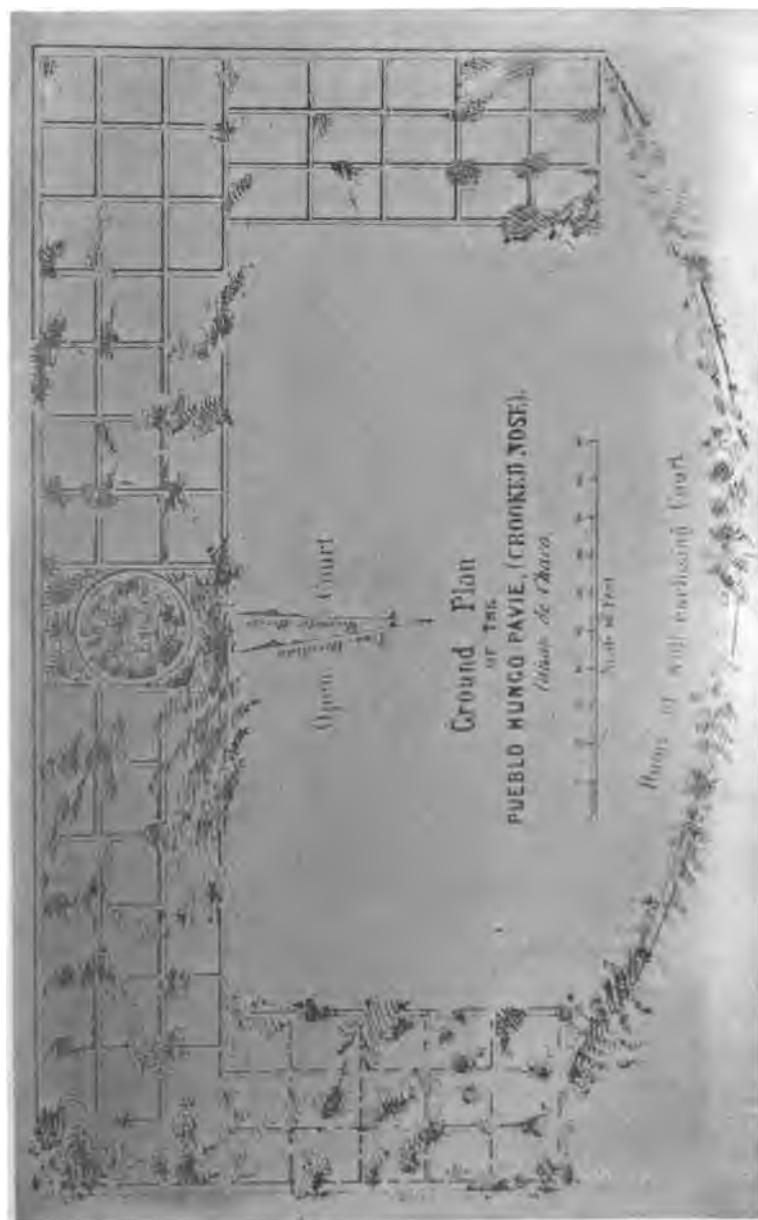


FIG. 9.



FIG. 10. RESTORATION OF PUEBLO HUNGO PAVIE.



any structures superior to them in character. The edifices in Yucatan and Central America, however, are very much superior. The Pueblo of Hungo Pavie is one of the smallest of the series, the main building being three hundred feet long, according to Lieutenant Simpson, and the wings each one hundred and forty-four feet in length; and yet it is larger than the largest structure in Yucatan or Central America yet discovered. Hungo Pavie was three stories high, built in the terraced form, and the walls were of stone. There were seventy-two apartments in the first story, some of which are thirteen by eighteen feet in dimensions; forty-eight apartments in the second story, and twenty-four in the third,—making in the aggregate one hundred and forty-six apartments. The Pueblo would accommodate from five hundred to eight hundred people, living in the fashion of Indians in the middle status of barbarism. The walls are about three feet thick in the first story, diminishing slightly in thickness in each succeeding story. They were built of tabular pieces of unhewn sandstone, laid with adobe mortar. The stones, were neither dressed nor reduced to a surface uniformly level, but being small,—from three to six inches in thickness, and from six to eighteen in length,—they formed a fair wall. They were laid with some regard to evenness but the Indian mason did not hesitate to break the courses; and the several courses were not uniform, but generally of different thicknesses.

Figure 10 is also a copy of the plate in Lieutenant Simpson's Report. It is doubtless a tolerably accurate representation of this structure as it stood in 1540. We may recognize in this edifice a substantial reproduction of the miscalled "palace" of Montezuma in the Pueblo of Mexico, which, like this, was constructed upon the three sides of a court, in the terraced form, and two stories high. In the light which these New-Mexican houses throw upon those of the Mexicans, the house occupied by

Montezuma is seen to have been a joint-tenement house of the American model, as represented in the figure. It is, therefore, unnecessary to call any of these structures palaces in order to account for their size, or to assume a condition of society in which the palace of the ruler was built by the forced labor of his subjects.

Figure 11 is a copy from a plate in W. H. Jackson's report. It is more fully worked out than that given by Lieutenant Simpson, and has been selected because it is accompanied by a restoration of the structures by Mr. Jackson. "The length of Pueblo Bonito is five hundred and forty-four feet, and its width three hundred and fourteen feet. By referring to the plan, it will be seen that it only roughly approximates the usual rectangular shape. The two side wings are parallel with each other, and at right angles to the front wall, for a distance of seventy feet; the west wing then bends around until a little past a line drawn through the centre of the ruin transversely, when it bears off diagonally to join the east wing, — thus resembling in outline a semi-oval. Instead of a semi-circular wall, the court is enclosed by a perfectly straight row of small buildings, running almost due east and west, and is intersected by a line of *estufas*, which divide it (the court) into two nearly equal portions. A marked feature is the difference in the manner of construction, as shown in the character of the masonry and of the ground plan. It was not built with the unity of purpose so evident in the Pueblo of Chetro Kettle and some others, but large additions have been spliced in from time to time, producing a complexity in the arrangement of the rooms difficult to follow out."¹ This is the largest single Pueblo structure ever erected in North America, in the extent of its accommodations. Lieutenant Simpson estimated the number of rooms at six hundred and forty-one.²

¹ Jackson's Report in Hayden's Geological and Geographical Survey of the Territories, 1876, p. 440.

² Simpson's Report, p. 84.

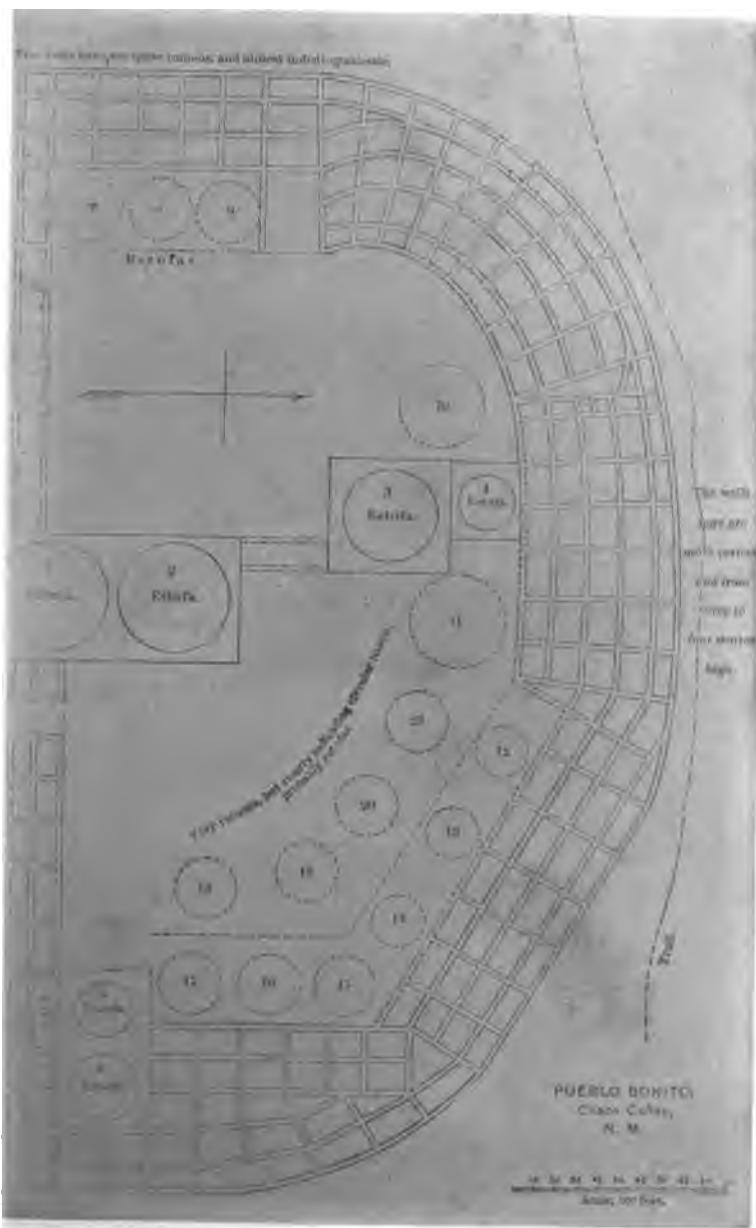
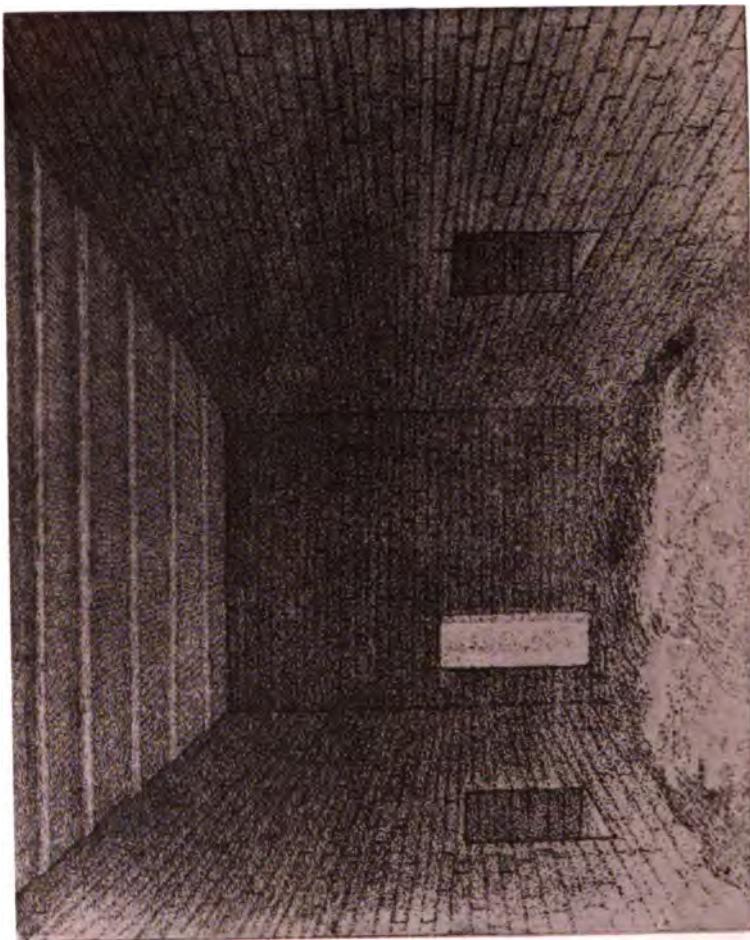






FIG. 12. ROOM IN PUEBLO BONITO.



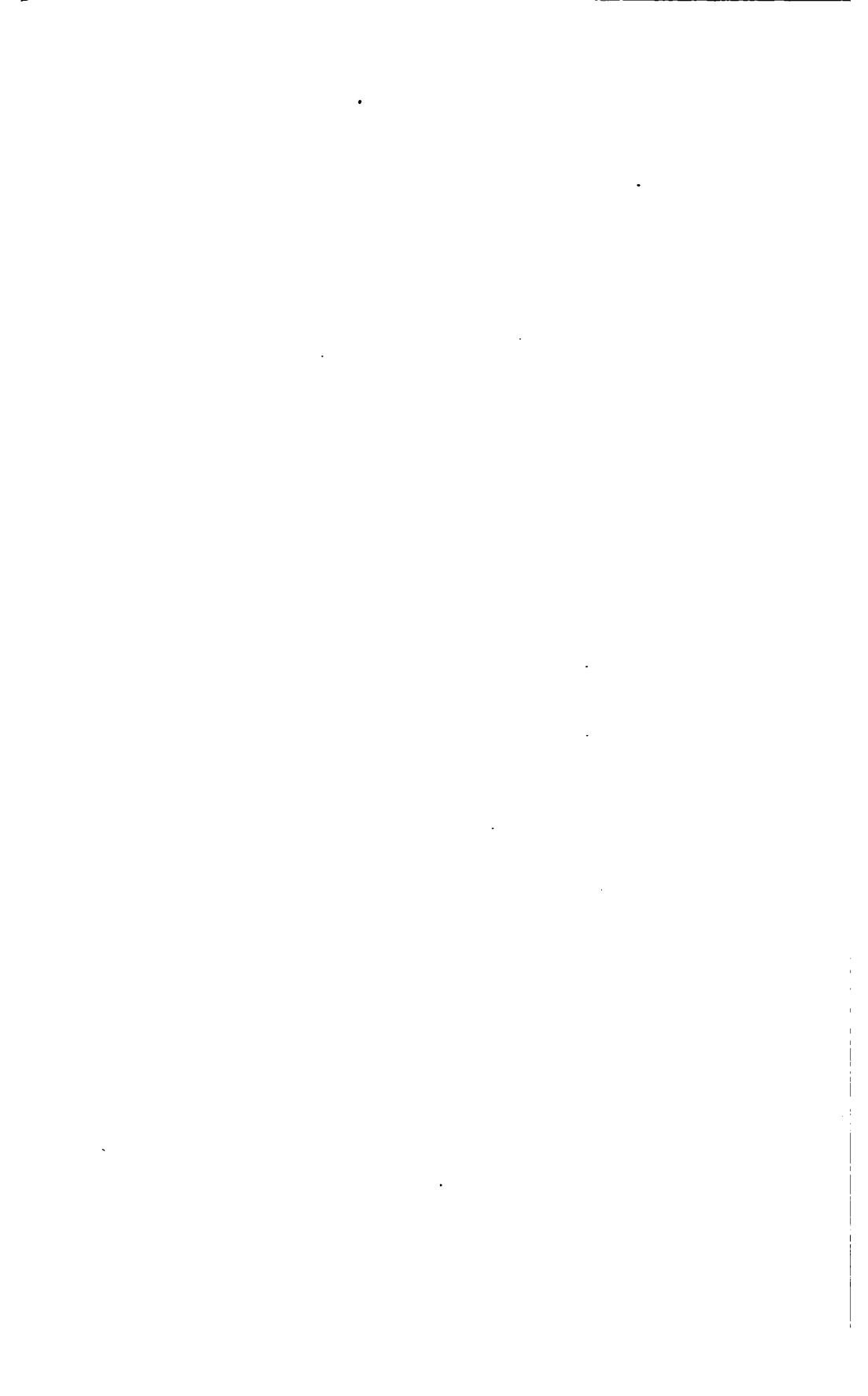




FIG. 13. CONJECTURAL RESTORATION OF PUEBLO BONITO.

Lieutenant Simpson found one room entire in the ruins of this Pueblo, and from his plate Fig. 12 is taken. It shows a doorway in one wall, and there was, doubtless, another through the opposite wall not shown. There are two niches sunk in the side walls. Cedar beams about a foot in diameter are laid from wall to wall. Small poles are laid transversely, close together upon these beams. Upon the transverse poles are laid slips of cedar or cedar-bark, which are covered with a coat of adobe mortar, three or four inches thick. The adobe which completes the ceiling of the room below becomes the floor of the room above. The rooms in the houses now inhabited in New Mexico have their ceilings and floors made in precisely the same manner.

Mr. Jackson's study of this ruin enabled him to produce a restoration of it, of which a plate is given in his report, and is here reproduced (Fig. 13). It is an interesting work, considered as a restoration which can only claim to be approximately correct. It will be noticed that three passageways are left open into the court, although the ground plan shows but one. In the Yucatan edifices, as the House of the Nuns at Uxmal, there is usually a triangular-arched gateway through the centre of the building, facing the court. The court is also open at each of the four angles, but three openings may have been protected by palisades in time of danger.

As to the manner of constructing these edifices, it is probable that they were not finished at once, but that they were added to, from time to time, and from generation to generation, as the inmates increased in numbers and the Pueblo in prosperity. Like a feudal castle, each house was a growth by additions made as exigencies required. And when one of these houses, after attaining a sufficient size, became overcrowded with inhabitants, it seems likely that a strong colony, like the swarm from the parent hive, moved out and began a new house, above or below, on the

same stream. This process might be repeated, from generation to generation, as the people prospered, until seven or eight Pueblos might grow up within an extent of ten or fifteen miles, — as in the valley of the Chaco and in the valley of the Scioto. When the capabilities of the district were becoming overtaxed for their subsistence, the colonists would seek more distant homes. At the period of the highest prosperity of these Pueblos, which was prior to 1540, the cañon, or rather valley, of the Chaco must have offered remarkable advantages for subsistence. The space between the walls of the cañon is less than half a mile in width, and the amount of water passing through it is small. In July, according to Lieutenant Simpson, the running stream is in places eight feet wide and a foot and a half deep; while in May, Mr. Jackson found no running water, and the valley entirely dry with the exception of occasional pools of water. The condition of the region is shown by the contrast of these two months. During the rainy season, which is also the season of the growing crops, there is an abundance of water, while in the dry season it is confined to springs and pools.

Figure 14 represents one of two large adobe structures, constituting the Pueblo of Taos, in New Mexico. It is situated upon Taos Creek, at the western base of the Sierra Madre Range, which borders on the east side of the broad valley of the Rio Grande, into which the Taos stream runs. It is an old and irregular building, and is supposed to be the Braba of Coronado's expedition.¹ Some ruins yet remain, not far off, of a still older Pueblo, whose inhabitants, the Taos Indians as they affirm, conquered and dispossessed. The two structures stand about twenty-five rods apart, on opposite sides of the stream, and facing each other. That upon the north side is about two hundred and fifty feet long, one hundred and thirty feet deep, and six stories high; and that upon the south side is of nearly

¹ *Transactions of the Ethnological Society*, ii. Introd. p. lxxi.

FIG. 14. NORTH PUEBLO OF TAOS.









FIG. 15. INTERIOR OF A MOQUIS HOUSE.

the same dimensions, and five stories high. The present population of the Pueblo, about four hundred individuals, are divided between the two houses, and they are a thrifty, industrious, and intelligent people. Upon the east side is a long adobe wall protecting the open space between the two buildings. A corresponding wall may have closed the space on the west, thus forming a large court between the buildings; but, if so, it has now disappeared. The creek is bordered on both sides with fields or gardens, which are irrigated by canals draining water from the stream. The adobe is of a yellowish brown color, and the two structures make a striking appearance as they are approached. Fireplaces and chimneys have been added to the principal room of each family; but it is evident that they are modern, and that the suggestion came from Spanish sources. They are constructed in the corner of the room. The first story is built up solid, and those above recede in the terraced form. Ladders planted against the walls show the manner in which the several stories are reached, and, with a few exceptions, the rooms are entered through trapdoors by means of ladders. Children, and even dogs, run up and down these ladders with great freedom. The lower rooms are used for storage and granaries, and the upper for living rooms,—the families in the rooms above owning and controlling the rooms below those which they occupy. The Pueblo has its chiefs and officers of different grades, and presents the appearance of a well-ordered community.

The illustration opposite is taken from a plate in Lieutenant Ives's Report.¹ Two rooms in one of the Moqui Pueblos are shown together. Water jars of native manufacture are standing on the floor, and corn braided by the husks is hanging on the walls. Lieutenant Ives says: "The room was fifteen feet by ten; the walls were made of adobes, the partitions of substantial beams; the floor

¹ Report upon the Colorado River of the West, p. 121.

laid with clay. In one corner were a fireplace and chimney. Everything was clean and tidy. Skins, bows and arrows, quivers, antlers, blankets, articles of clothing and ornament were hanging from the walls or arranged upon shelves. Vases, flat dishes, and gourds filled with meal or water, were standing along one side of the room. At the other end was a trough, divided into compartments, in each of which was a sloping stone slab, two or three feet square, for grinding corn upon. In a recess of an inner room was piled a goodly store of corn in the ear. . . . Another inner room appeared to be a sleeping apartment, but this, being occupied by females, we did not enter." The ceiling, it will be noticed, is formed in the same manner as in the Pueblo Bonito ruins. (*Supra*, Fig. 12.)

The Pueblo of Taos alone is sufficient to explain the manner in which the Pueblos in ruins, in the valley of the Chaco and elsewhere in and near New Mexico, were occupied three centuries and more ago. They are parts of the same system of works architecturally, and were occupied by tribes of Village Indians, from whom the present Village Indians are descended. All alike, they are joint-tenement houses, in the nature of fortresses, and the plan of life within them must be sought in the present Pueblos, assisted by the light of tradition.

III. This general view of the houses and house-life of the American aborigines is strengthened by extending the comparison to the earth-works of the Mound Builders, which are wholly inexplicable apart from the explanation the joint-tenement house is capable of affording. The Mound Builders were in advance of the northern tribes in culture, and were of the grade of the Village Indians in New Mexico, from which region they were, in all probability, derived. Without stopping to discuss the distribution of these earth-works, or to describe them specially, it must be concluded that they were the sites of villages.

The question then recurs, For what purpose did the Mound Builders raise these embankments at an expenditure of so much labor? No answer has been given to this question, and no serious attempt has been made to explain their uses. These embankments were constructed for some practical purpose, and that purpose must be sought in the needs and mode of life of the Mound Builders as Village Indians; and it should be expressed in the works themselves.

If, then, a tribe of Village Indians, with the habits and experience this condition implies, emigrated centuries ago in search of new homes, and if in the course of time they or their descendants reached the Scioto valley in Ohio, they would have found it impossible to construct houses of adobe brick able to resist the rains and frosts of the climate. Some modification of their house architecture would be forced upon them through climatic reasons. They might have used stone, if possessed of sufficient skill to quarry it and construct walls of it. Or, they might have fallen back upon a system of construction of inferior grade, with houses set upon the level ground, such as those of the Minnitares and Mandans. *Or, they might have raised these embankments of earth, enclosing circular, rectangular, or square areas, and constructed their Long Houses upon them.* It is submitted conjecturally that this is precisely what they did. Such houses would agree, in general character and plan, and in the uses to which they were adapted, with those of the Indian tribes found in all parts of America.

In the valley of the Scioto in Ohio, and within an extent of twelve miles, were found the remains of seven villages of the Mound Builders, four upon the east and three upon the west side of the river. They are among the best of their works, and furnish fair examples of the whole. The situation of these Pueblos, at short distances from each other on the same stream, accords with the usages of the Village

Indians of New Mexico, Mexico, and Central America, in locating their villages.

One of the number, the High-Bank Pueblo, is shown in the figure (Fig. 16), with a restoration.

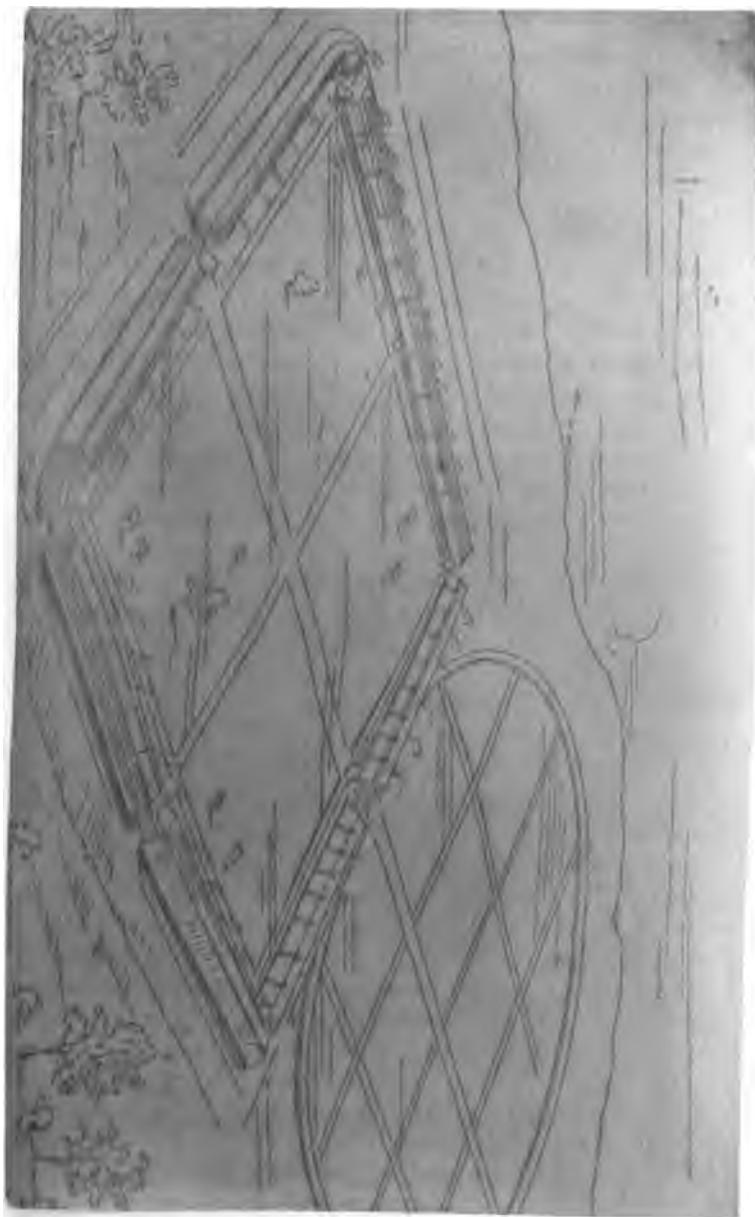
The plan is taken from the work of Squier and Davis.¹ These authors remark that "the principal work consists of an octagon and circle; the former measuring nine hundred and fifty feet, the latter ten hundred and fifty feet in diameter. . . . The walls of the octagon are very bold, and, where they have been least subject to cultivation, are now between eleven and twelve feet in height by about fifty feet base. The wall of the circle is much less, nowhere measuring over four or five feet in altitude. In all these respects, as in the absence of a ditch, and the presence of the two small circles, this work resembles the Hopeton Works." Of the latter, which are nine miles above on the Scioto, they remark "that the walls of the rectangular work are composed of a clayey loam, twelve feet high by fifty feet base. . . . They resemble the heavy grading of a railway, and are broad enough on the top to admit the passage of a coach."²

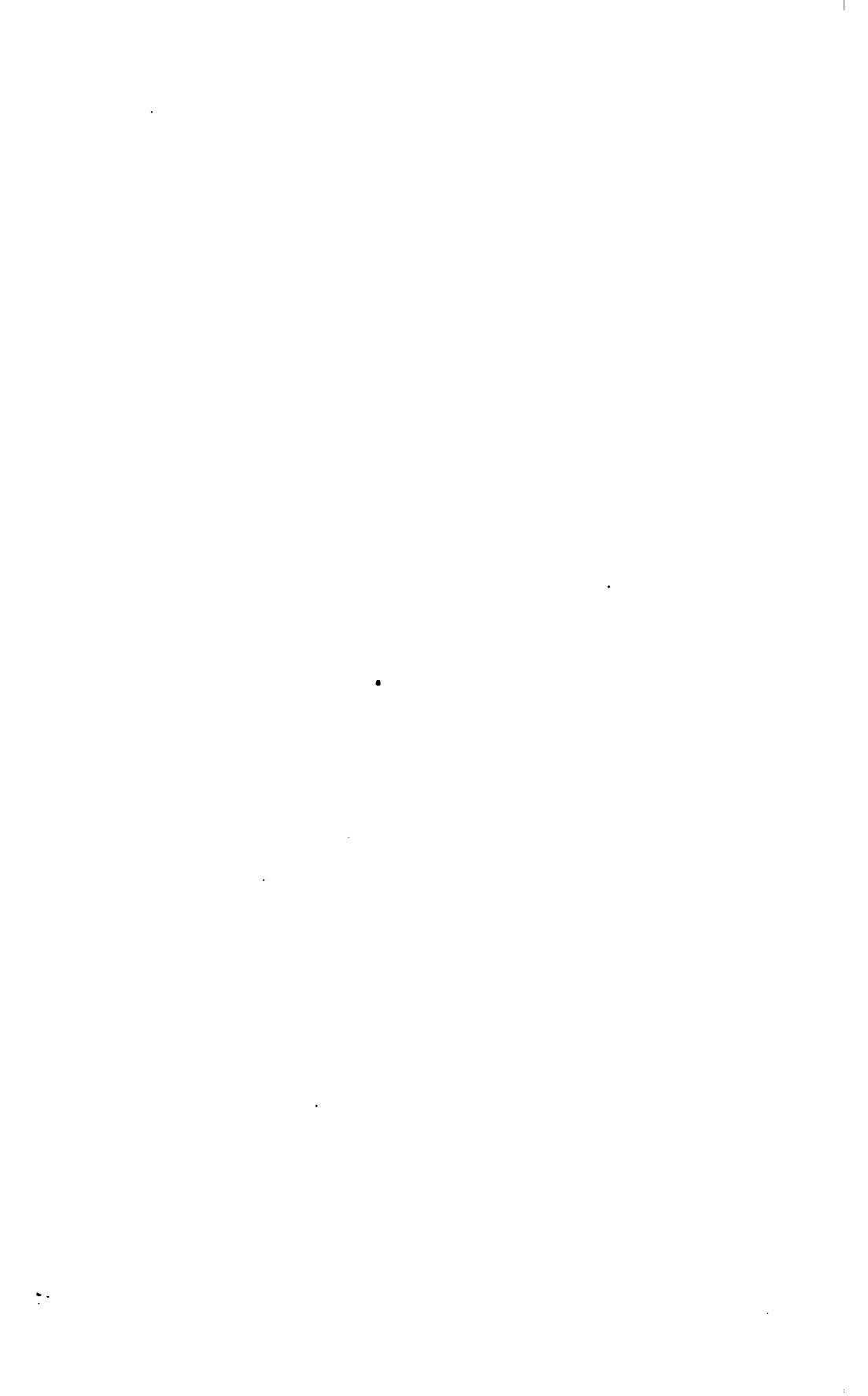
If the embankments of the High-Bank Pueblo were re-formed, with the materials washed down and now spread over a base of fifty feet, with sloping sides and a level summit, they would form new embankments, thirty-seven feet wide at base, ten feet high, and with a summit platform twenty-two feet wide. If a surface coating of clay were used, the sides could be made steeper, and the summit platform broader. Such embankments would provide an ample site for long, joint-tenement houses, divided into chambers, opening upon a central passageway through the structure from end to end, as in the Long Houses of the Iroquois.

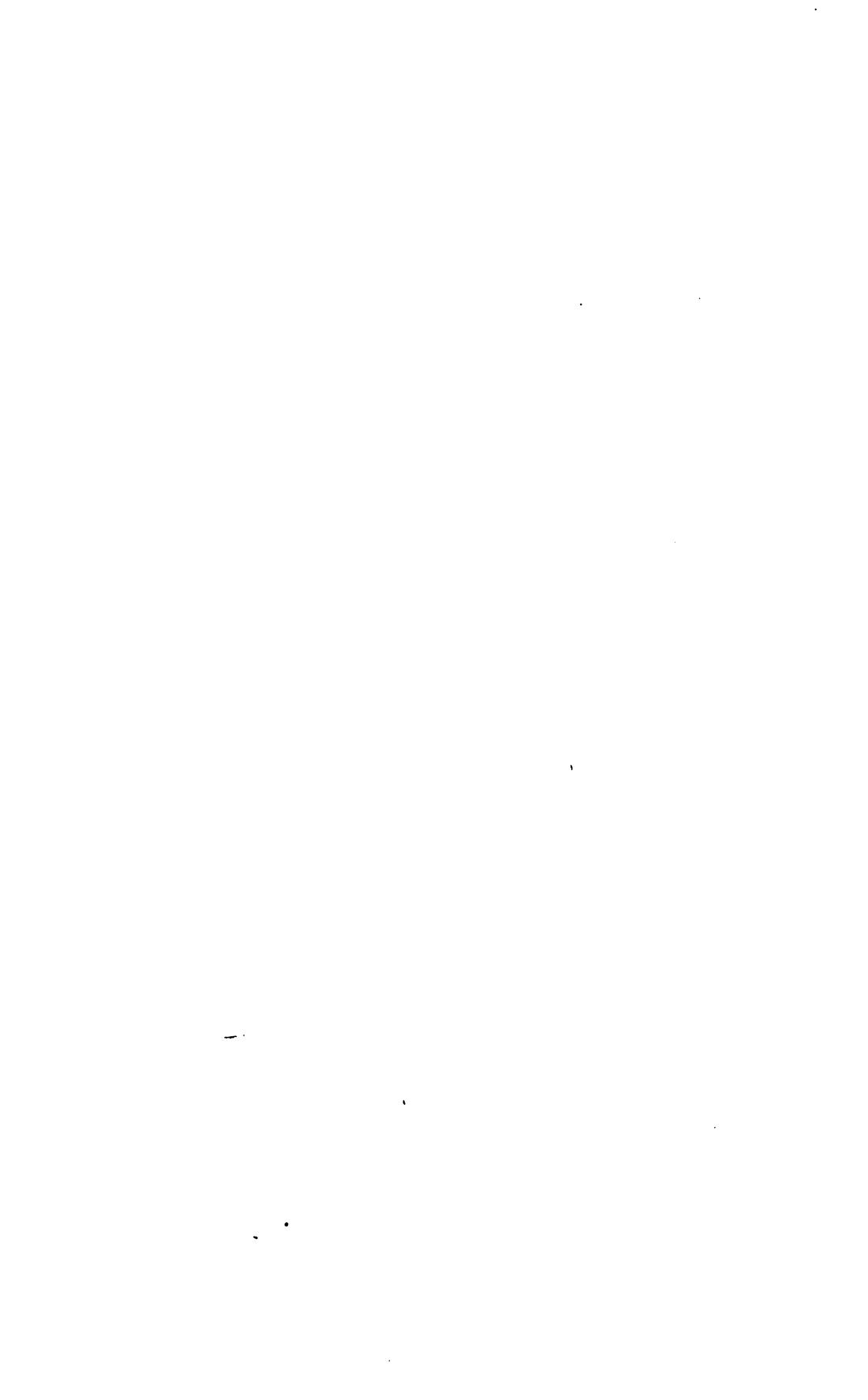
¹ Ancient Monuments of the Mississippi Valley. Smithsonian Contributions to Knowledge. Vol I., Pl. XV.

² Ib. p. 50.

FIG. 16. HIGH-BANK PUEBLO.







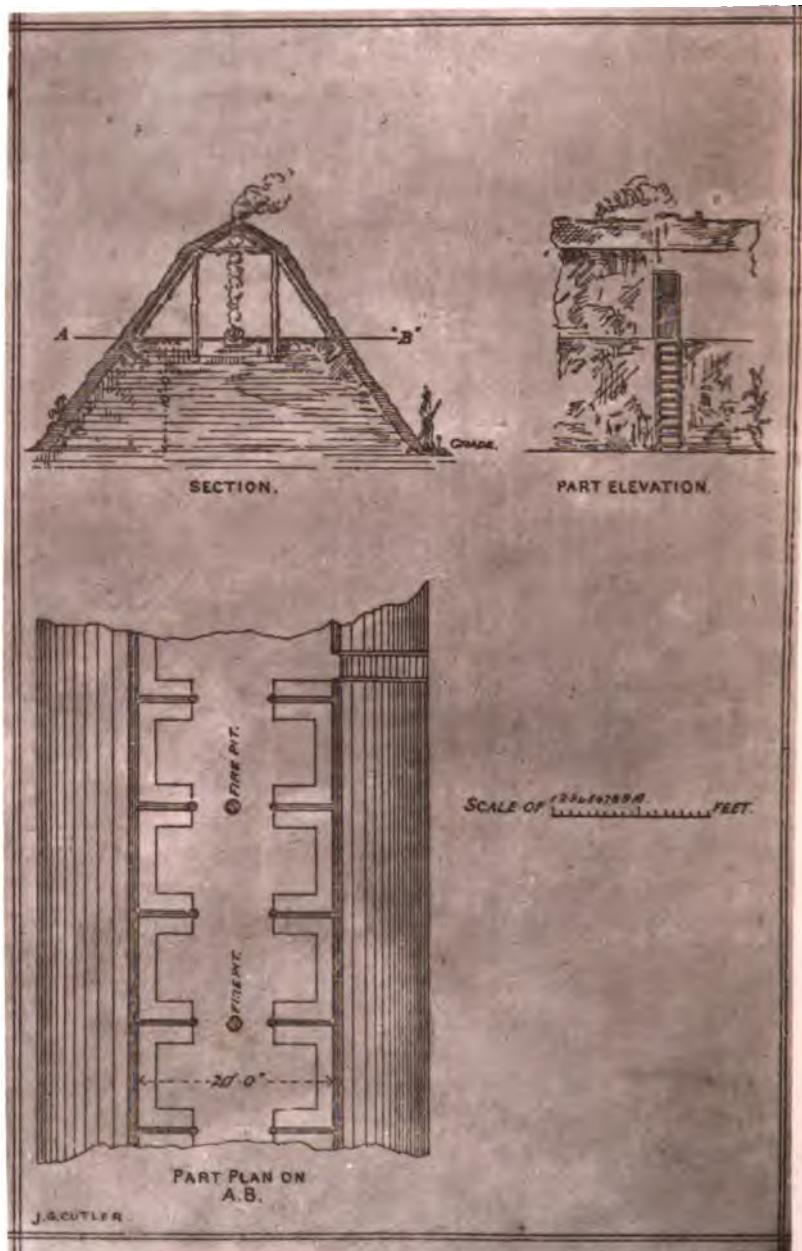


FIG. 17. GROUND PLAN AND SECTION OF HOUSE, HIGH-BANK PUEBLO.

The embankment, indeed, answered as a substitute for the first story of the house, which was usually from ten to twelve feet high, and closed up solid externally. The gateways entering the square were protected, it may be supposed, with palisades of round timber set in the ground, each row of stakes commencing at the opposite ends of the embankments, and contracting, after passing each other, to a narrow opening on the inside, which might be permanently closed. Indian tribes in a lower condition than the Mound Builders were familiar with palisades. The enclosed square was thus completely protected by the Long Houses standing upon the embankments, and by the gate-ways guarding the several entrances. The Pueblo, externally, would present a continuous rampart of earth, about ten feet high, around the enclosed area; upon this rampart the timber-framed houses, ten or twelve feet in height, with their walls coated thickly with earth or gravel, and sloping in a continuous line with the embankment, would form with it an unbroken wall not less than twenty feet high.

It is not necessary that the actual form and structure of the houses of the Mound Builders should be shown, in order to establish the hypothesis that these embankments were the veritable sites of their houses. If it is made evident that the summit platforms of these embankments would afford practicable sites for houses, adapted to the climate and to the modes of Indian life, this is all that can be required. The hypothesis rests upon the defensive principle in the house architecture of the Village Indians, and upon a state of the family requiring joint-tenement houses. To both of these requirements this conjectural restoration of one of the Pueblos of the Mound Builders responds in a remarkable manner. In the diversified forms of the houses of the Village Indians in all parts of America the defensive principle is a constant feature. Among the Mound Builders, a rampart of earth ten feet high around a village

would afford no protection; but surmounted with Long Houses, the walls of which rose continuous with the embankments, the strength of these walls, though of timber coated with earth, would render a rampart thus surmounted and doubled in height a formidable barrier against Indian assault. The second principle—that of communism in living in joint-tenement houses, which is exhibited not less clearly in the houses of the Village Indians in general than in the supposed houses of the Mound Builders—harmonized completely with the first. From the two together sprang the house architecture of the American aborigines, with its diversities of form; and they seem sufficient for its explanation. The Mound Builders in their new area east of the Mississippi, finding it impossible to construct joint-tenement houses of the adobe brick to which they had been accustomed, substituted solid embankments of earth in place of the first story closed up externally, and erected triangular houses upon them, covered with earth. Circumstances having compelled a change of plan, one was adopted that involved no violent departure from former modes of construction.¹

IV. The most interesting field of investigation in aboriginal house-architecture is in Yucatan, Chiapas, Guatemala, and Honduras, where it attained its highest form and reached its highest development. The adaptation to communistic living in large households is found in all the houses now in ruins in these areas. They are joint-tenement houses of the aboriginal American type. At the epoch of the Spanish conquest they were occupied Pueblos, and were deserted by the Indians to escape the rapacity of Spanish military adventurers, by whom they were oppressed and abused beyond Indian endurance.

¹ The houses of the Mound Builders have been more fully considered by the writer in an article in the *North American Review*, July, 1876, entitled "Houses of Mound Builders."

Instances, are mentioned by Herrera, where large numbers of the people destroyed themselves to escape the exactions of Spanish masters, whom they were unable to resist.¹ The numerous ruins of Pueblos, scattered through the forests of Yucatan and southward, are so many monuments of Spanish misrule, avarice, and rapacity.

Yucatan and Central America, at the time of the Spanish conquest, were probably more thickly peopled than any other portion of North America of the same territorial extent; and its inhabitants were more advanced than any other portion of the aborigines. Their Pueblos were planted along the water-courses, where such existed, often quite near each other, and presented the same picture of occupation and of village life found by the Spaniards, about the same time, on the Rio Chaco and Rio Grande, in New Mexico. They consisted of a single great house of stone, or of a cluster of great houses, forming one Pueblo. In some cases, four such structures were grouped together upon the same pyramidal platform. But there is no reason for supposing, from any ruins yet found, or from what is known of the condition of the Indian tribes at that time, that any one Pueblo in Yucatan or Central America contained as many as ten thousand inhabitants. Uxmal may possibly have contained as many, but this is mere conjecture. The people of Yucatan and Central America were found subdivided into a number of small tribes, and were in the same condition of disintegration and independence as the inhabitants of other parts of North America. The country was covered with dense forests, except the limited clearings around the Pueblos, and was for the most

¹ Cortez sent "James de Mazagueros to reduce the people of Chiapas, who had revolted, which that commander effectually performed; for when they could resist no longer, those desperate wretches cast themselves, with their wives and children, headlong from precipices." — *Herrera's Hist. of America*, III. 346.

part uninhabited. Field agriculture was unknown, but the Indians cultivated in *gårdens* beds maize, beans, squashes, tobacco, pepper, and cotton; sometimes raising two or three crops during the year. This tended to localize them in villages. Herrera remarks of the Village Indians of Honduras, "that they sow thrice a year, and they were wont to grub up great woods with hatchets made of flint."¹ Without metallic implements to subdue the forests, or even with copper axes, only a very small portion of the country would be brought under cultivation, and this would be confined to districts where water was accessible.

Las Casas, Bishop of Chiapas, who was in Central America about 1539, after remarking of the people of Yucatan that they were "better civilized in morals and in what belongs to the good order of societies than the rest of the Indians," proceeds as follows: "The pretence of subjecting the Indians to the Government of Spain is only made to carry on the design of subjecting them to the dominion of private men, who make them all their slaves."² And again he quotes from the letter of the Bishop of St. Martha to the King of Spain, as follows: "To redress the grievances of this province, it ought to be delivered from the tyranny of those who ravage it, and committed to the care of persons of integrity, who will treat the inhabitants with more kindness and humanity; for if it be left to the mercy of the governors, who commit all sorts of outrages with impunity, the province will be destroyed in a very short time."³

It is sufficiently ascertained that, within a few years after the conquest of Mexico, Yucatan and Central America were overrun by military adventurers, whose rapacity and violence drove the harmless and timid Village Indians from

¹ History of America, 2d. ed. p. 725. Stevens's Trans. IV. 133.

² An Account of the First Voyages, etc. in America. 2d. ed. p. 699. Translation, p. 52. ³ Ib. p. 61.

their Pueblos into the forests,—thus destroying in a few years a higher culture than the Spaniards substituted in its place. Nothing can be plainer, we think, than the following facts: (1) That the houses now in ruins in these areas were occupied Pueblos at the time of the Spanish conquest; (2) That the present Indians in these countries are the descendants of the people who constructed these houses; and (3) That all there ever was of Palenque, Uxmal, Copan, and other Indian Pueblos in these countries, building for building, and stone for stone, is now there in ruins.

Ground plans and elevations of Yucatan houses are necessary for comparison with those previously given. They will be taken chiefly from the ruins of Uxmal, which are the best known and the most extensive ruins in Yucatan. Several stone structures are here found upon six pyramidal elevations. These, together, formed the Pueblo of Uxmal, now called the "Governor's House," the "House of the Nuns," the "House of the Pigeons," the "House of the Turtles," the "House of the Dwarf," and the "House of the Old Woman." There are said to be traces of some other buildings of inconsiderable size. They are constructed of stone, laid in regular courses, and partially dressed, as represented by Mr. John L. Stephens. The upper half of the exterior walls, as of many other Yucatan structures, are decorated with grotesque ornaments cut in the faces of the stones. Foster says: "These structures are composed of a soft coralline limestone of comparatively recent geological formation, probably of the tertiary period."¹ Norman had previously described the material used as "a fine concrete limestone."² Elsewhere, with respect to the kind of tools used in cutting this stone, he remarks that "flint was undoubtedly used."³ It is also to be noticed that the size of the stone used in all these

¹ Prehistoric Races in the United States, p. 398.

² Rambles in Yucatan, p. 126. ³ Ib. p. 184.

edifices is remarkably small. Norman, speaking of the ruins of Chichen, remarks, that "the stones are cut in *parallelopipeds* of about twelve inches in length and six in breadth, the interstices filled up of the same material of which the terraces are composed;"¹ but he also speaks of "large blocks of hewn stone used in the doorways."² The height of these buildings is generally about twenty-five feet, rarely thirty feet. A soft coralline limestone could be easily worked when first taken from the quarry, and would harden after exposure to the air.

The style of architecture in New Mexico brought the Indians to the house-tops as a common place of living, to

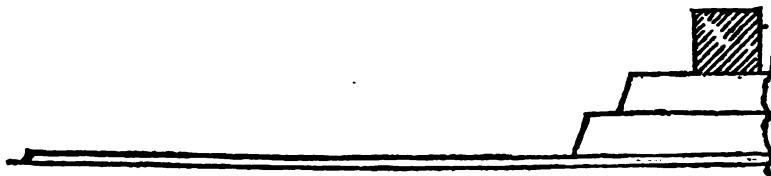


FIG. 18. SECTION OF PYRAMIDAL ELEVATION OF GOVERNOR'S HOUSE AT UXMAL. SIDE VIEW.

which their flat roofs were adapted. This habit, first adopted for security, became in time a settled custom. The same object of security was met, in Yucatan and Central America, by another expedient; namely, a pyramidal platform or elevation (Fig. 18), twenty, thirty, and forty feet high, upon the level summit of which large joint-tenement houses were erected. Besides these, there were small buildings, having a special purpose, erected on platforms still higher. A natural elevation was selected when practicable; the top was levelled or raised by artificial means; the sides made rectangular and sloping, and faced with dry stone walls, the ascent being made by flights of stone steps. It was not uncommon to form three such platforms, one above the other, as shown in the figure.

¹ *Rambles in Yucatan*, p. 127.

² *Ib.* p. 128.





FIG. 19. CASA DEL GOBERNADOR, UXMAL, YUCATAN.

The Governor's House is symmetrical in structure, three hundred and twenty-two feet long, thirty-six feet wide, and thirty feet high, consisting of but one story. Each apartment has a peculiar triangular ceiling of stone. It has no windows but eleven doorways in front, and contains twenty-four apartments, two of which are each sixty feet long. The rear wall is solid, with the exception of two doorways entering single apartments. This wall is nine feet thick through the greater part of its extent. A parallel wall through the centre divides the interior into two rows of apartments, of which those in front are eleven feet and six inches wide, and those in the rear thirteen feet wide. The only light received in the back rooms is through the doorways immediately in front, as the outer and inner doorways face each other.

This house stands upon the upper of three terraces or platforms, of which Mr. Stephen says: "The lowest of these terraces is three feet high, fifteen feet broad, and five hundred and seventy-five feet long; the second is twenty feet high, two hundred and fifty feet wide, and five hundred and forty-five feet in length; and the third, on which the building stands, is nineteen feet high, thirty feet broad, and three hundred and sixty feet in front."¹ As the building is thirty-six feet wide, he probably means that the terrace is thirty feet broad in front of the building. The general plan of the ruins at Uxmal shows that this house stands in the middle of the upper platform. The sides of these terraces were faced with "substantial stone walls."

The edifices in Yucatan and Central America are almost invariably but one story high, and but two rooms deep, the walls being carried up vertically to an equal height, and terminating in a flat top or roof. The doorways opened upon a platform area, called the terrace, and the place was defended on the line or edge of the terrace

¹ *Incidents of Travel in Yucatan*, I., 180.

walls. Neither adobe brick nor adobe roofs could withstand this tropical climate, with its pouring rains during a portion of the year. Stone and a vaulted ceiling were necessary to a durable structure. Upon these elevated platforms the inhabitants enjoyed the same security as the Village Indians of New Mexico on their roof-tops and within their walls. They were also above the flight of the mosquito and *garapitos*, the scourges of this tropical climate, as well as reasonably protected from the reptiles with which the region abounds. Considering the surrounding conditions, these single-storied houses of stone upon raised platforms harmonize with the communal type of architecture as fully as the form in New Mexico or in the valley of the Columbia. None of the houses in Yucatan and Central America have fireplaces or chimneys, which shows that no cooking was done in them. The rooms in them do not communicate, but are either single or in pairs, and are entered from the terrace; and this peculiarity of itself refutes the surmise that any one of these structures was a palace. It tends to show that these rooms were occupied by groups of persons, whose sections of the house were separated from each other by solid division walls, and that the food for each group was cooked on the terraces, at separate fires, from common stores, and divided at the kettle.

We now come to the important inquiry, whether the American Indians had reached a knowledge of the post and lintel as a principle of construction in their architecture. It will be understood that the pier is the stone equivalent of the post. The use of the pier and lintel is the first characterized stage of scientific architecture in stone. The lintel of wood has been found in New Mexico, but not the lintel of stone, except in occasional instances.¹ Speaking of the Governor's House, Mr. Stephens remarks

¹ I found a stone lintel, about eighteen inches in length, over an opening in a Cliff House on the Mancos River, in 1878. The wall was of stone.

that "the doors are all gone, and the wooden lintels over them have fallen."¹ "In some of the inner apartments the lintels were still in their places over the doorways, and some were lying on the floor, sound and solid, which latter condition was no doubt owing to their being more sheltered than those over the outer doorway."² The same is true of the House of the Nuns, and of a large number of other structures figured and described in Mr. Stephens's work. But lintels of stone were found in a number of buildings. Thus of one of the houses at Kabah, he says, "The lintels over the door are of stone."³ In this case, as appears from Mr. Stephens's plate, there was a stone column in the middle of the doorway, and the lintel was in two sections; but there were a number of cases where single lintels of stone were found. Norman, speaking of the ruins of Chichen, remarks that "the doorways are nearly a square of about seven feet, somewhat resembling the Egyptian, the sides of which are formed of large blocks of hewn stone. In some instances the lintels are of the same material."⁴ Sapote wood was often used for lintels,—a wood remarkable for its solidity and durability. It may safely be said that the lintel of wood was the rule in Yucatan and Central America, and not the exception; that the Indians understood the use of the lintel, but that the constant use of the stone lintel, which alone was capable of affording a durable structure, was beyond their ability, or at least their means. It cannot be said, therefore, that the use of the pier and lintel of stone had become a principle of construction in their architecture. As the Mayas who constructed these edifices were in the middle status of barbarism, it was not to be expected that their architecture would bear such a high test of advancement as the use of the pier and lintel

¹ Incidents of Travel in Yucatan, I., 175.

² Ib. I., 178.

³ Ib. I., 393.

⁴ Rambles in Yucatan, p. 128.

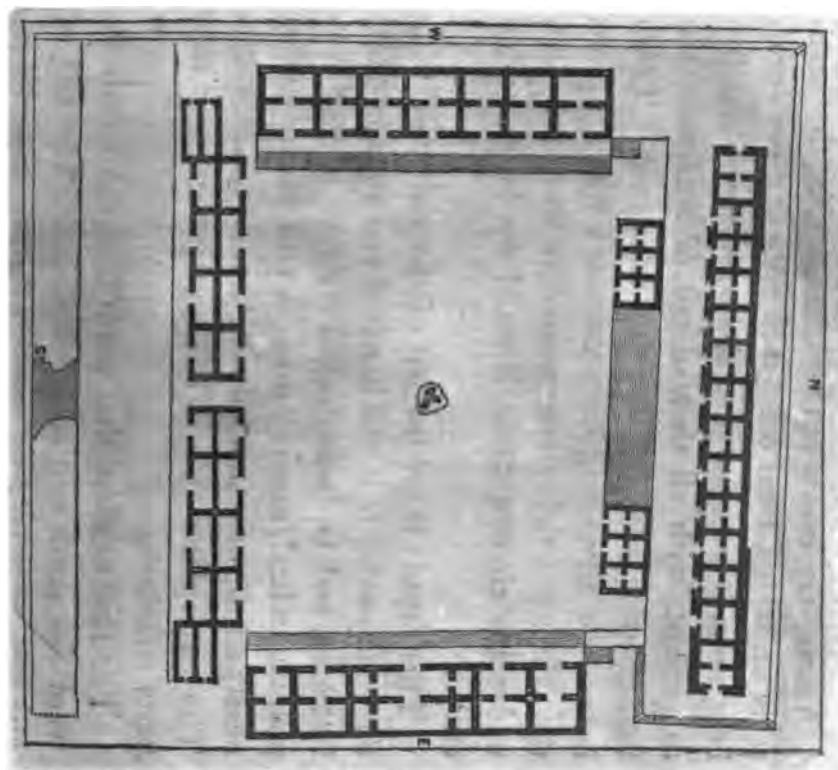
of stone would imply. Mankind are compelled to feel their way experimentally in architecture, as in other departments of knowledge.

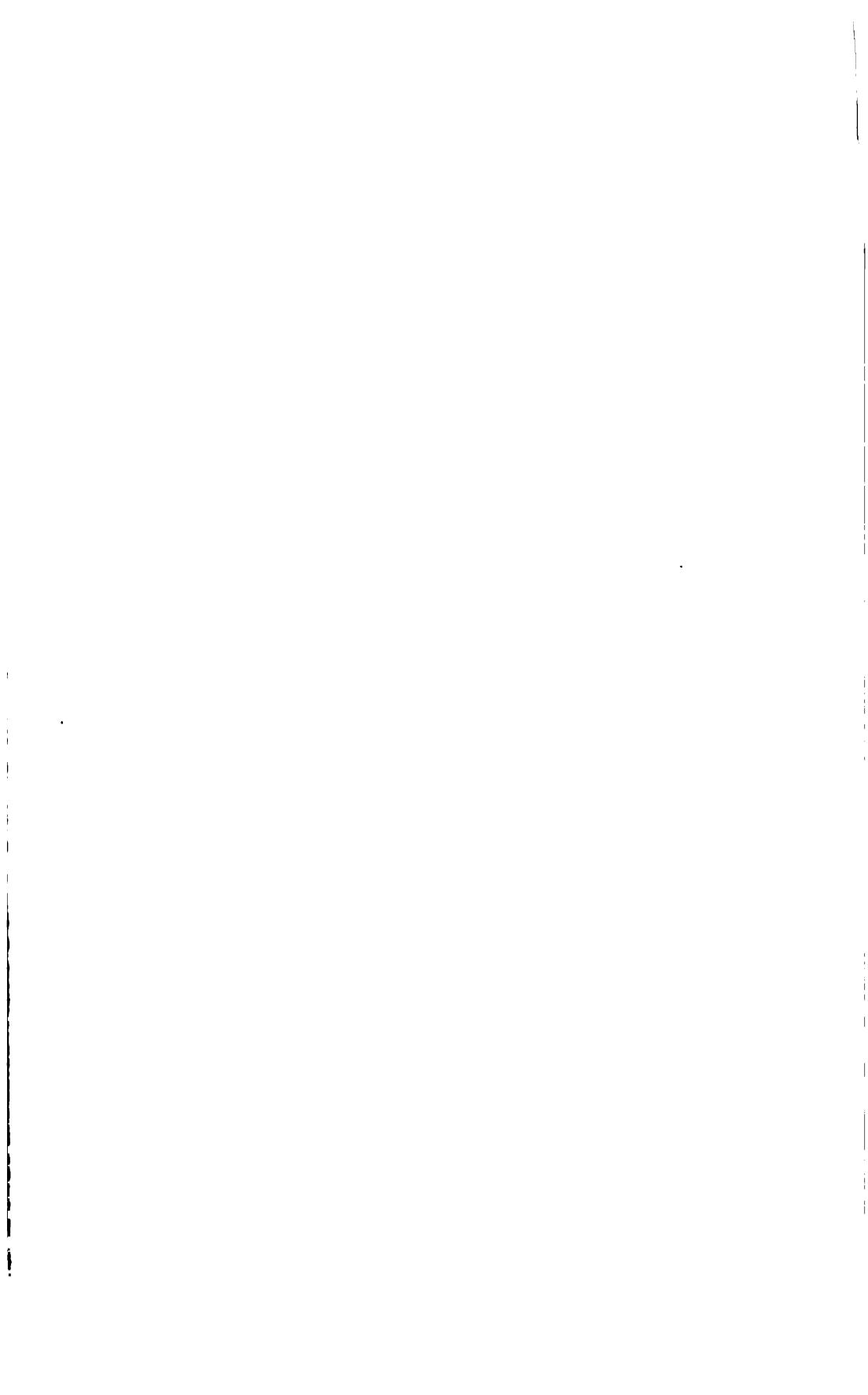
"The House of the Nuns" (Fig. 20), says Mr. Stephens, "is quadrangular, with a courtyard in the centre. It stands on the highest of three terraces. The lowest is three feet high and twenty feet wide; the second, twelve feet high and forty-five feet wide; and the third, four feet high and five feet wide, extending the whole length of the front of the building. The front [building] is two hundred and seventy-nine feet long, and above the cornice, from one end to the other, it is ornamented with sculptures. In the centre is a gateway ten feet, eight inches wide, spanned by a triangular arch, and leading to the courtyard. On each side of this gateway are four doorways, with wooden lintels, opening to apartments averaging twenty-four feet long, ten feet wide, and seventeen feet high to the top of the roof, but having no communication with each other. The building that forms the right or eastern side of the quadrangle is one hundred and fifty-eight feet long; that on the left is one hundred and seventy-three feet long; and the range opposite, or at the end of the quadrangle, measures two hundred and sixty-four feet. These three ranges of buildings have no doorways outside, but the exterior of each is a dead wall, and above the cornice all are ornamented with the same rich and elaborate sculpture."¹

The four buildings contain in the aggregate seventy-six apartments, which vary in size from ten to twelve feet wide, and from twenty to thirty feet long. There are twenty single apartments, and twenty-four pairs of apartments, half of which, as in the Governor's House, are dark, except as they are lighted from the doorway of the room in front. In the structure on the right, in the figure, there are six rooms connected with each other, which number is

¹ *Incidents of Travel in Yucatan*, I., 299.

FIG. 28. PLAN OF THE "HOUSE OF THE NUNS," DAKMAL.





so unusual as to attract attention. The subjoined figure of the interior of a room is the centre front room, showing the doorway into the back room, and also out upon the terrace, as well as the doorway into the small room at the end. Each of these joint-tenement houses would accommodate, after the fashion of the Village Indians, an average of five hundred persons.

The House of the Pigeons consists of two quadrangles, of which the second is some steps higher than the first. The enclosed court of the first is one hundred and eighty feet long and one hundred and fifty-six feet wide, and has buildings in ruins in three sides. Passing through and out of the court by an arched gateway, and ascending a flight of eleven steps, the second court is entered, which is one hundred feet long by eighty-five feet wide, with ruined buildings on the two sides, and a teocallis of earth at the opposite end, two hundred feet in length and one hundred and twenty feet wide, and about fifty feet high. Upon the top stands a long, narrow building one hundred feet long by thirty feet wide, divided into three apartments.¹ The buildings upon the two courts, like the House of the Nuns, were the residence portion of this part of the Pueblo. No ground plans are given, and the elevation of a portion of the structure given in Stephens's work shows a difference in the style of the masonry. The Governor's House compares very well with the Tecpan of the Pueblo of Mexico, which was the "Official House of the Tribe," as explained by Mr. Bandelier in his valuable and instructive essay "On the social organization of the Ancient Mexicans," in the twelfth annual report of the Peabody Museum at Cambridge.² The House of the Nuns and the two quadrangles called the House of the Pigeons were probably the homes of the body of the tribe which constructed and inhabited this Pueblo.

¹ Incidents of Travel in Yucatan, I., 319.

² Report, pp. 645, 654, 671.

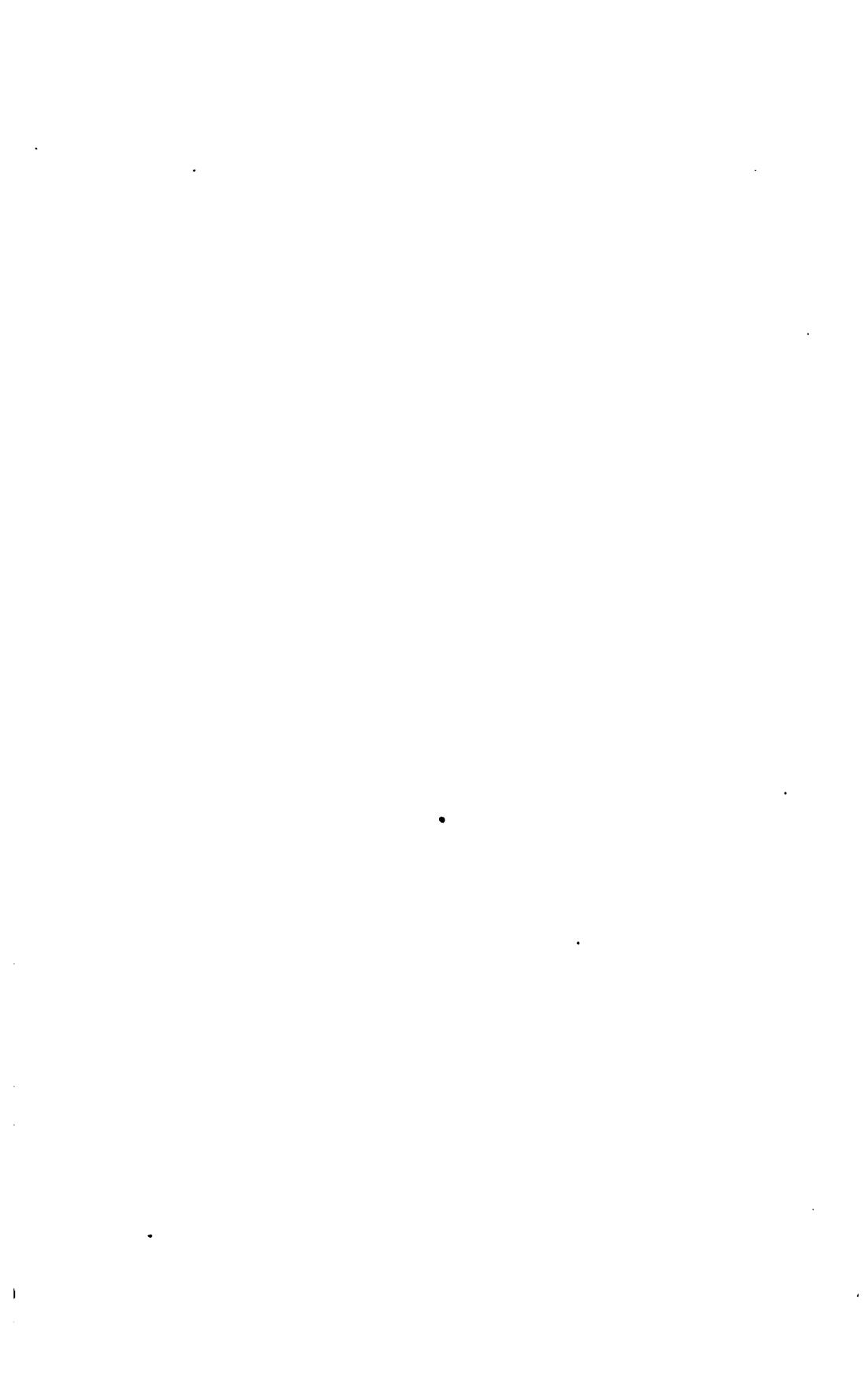
The view (Fig. 21) of the interior of a room in the House of the Nuns is taken, like the three preceding and the three succeeding figures, from Stephens's "Incidents of Travel in Yucatan." It is the central front room in the building on the right hand, where six rooms, front and rear, communicated with each other. It shows the form of the triangular ceiling common in all the principal edifices in Yucatan and Central America at the period of the Spanish conquest. It is a triangular arch without a keystone, and without the principle of the arch; but the edges of the stone are bevelled, and form a perfect vault over each apartment, except a space a foot wide in the centre at the peak, where the wall is carried up vertically a foot or more, and then covered with a cap of stone. The mechanical principle is the same as in a doorway found in New Mexico by Lieutenant Simpson; but here applied, on a more extended and more difficult scale, to form the ceiling of the room, and also a gateway through a building into a court. It is the most remarkable feature in this architecture, mechanically considered. This vaulted ceiling was constructed over a solid core of masonry, afterwards removed. A projecting, external wall at the line of the top of the doorways was carried up flush with the cornice to the top of the building. This served to balance the inward projection of the ceiling as it rose toward the peak. When the two sides were capped with flat stones at the centre, and the masonry had been carried up five or more feet above the cap, the superincumbent mass held the ceiling in its place, the weight resting on the side walls.

The cross section (Fig. 22) shows the relations of the walls to the ceiling and the mass of the masonry above. Once constructed over a core, with the masonry above in place, the removal of the core would not endanger the structure.

Near Uxmal are the interesting ruins of Zayi, which present a new feature in Yucatan house-building. Upon a



FIG. 21. INTERIOR OF AN APARTMENT IN THE "HOUSE OF
THE NUNS," UXMAL.



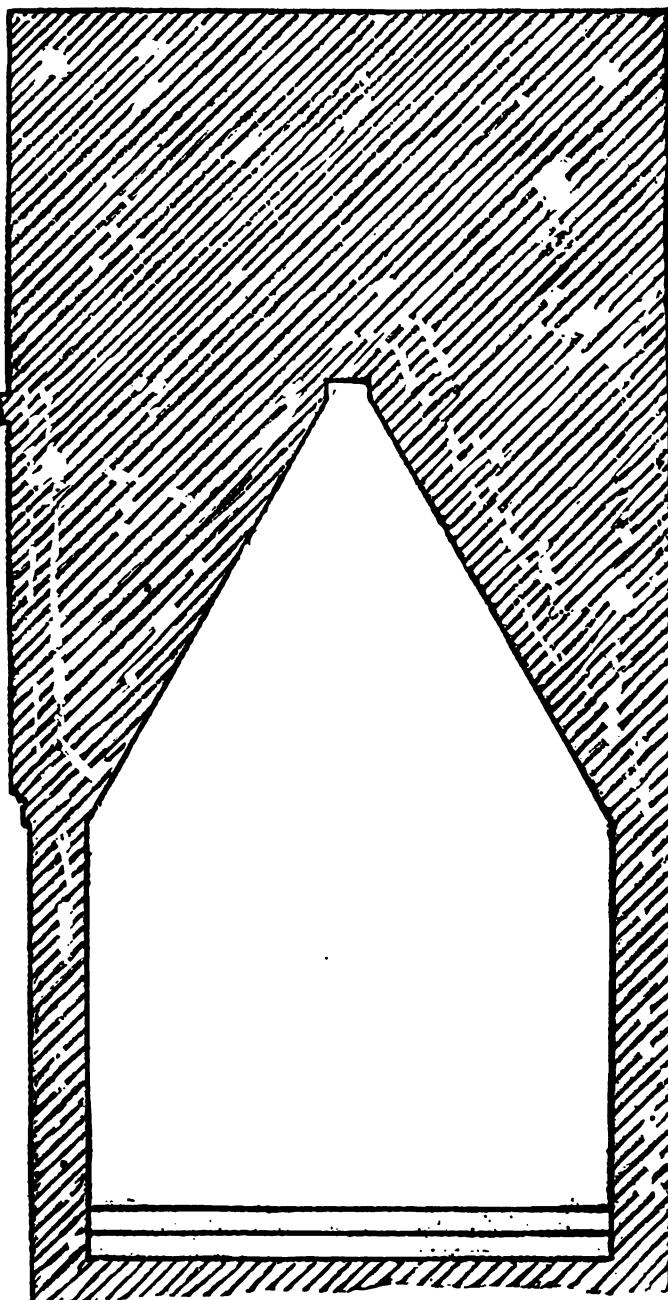


FIG. 22. CROSS SECTION OF APARTMENT.

low eminence are three independent structures, the second within and above the first, and the third within and above the second, presenting in the distance the appearance of a single quadrangular edifice in three receding stories (Fig. 23). But each stands on a separate terrace, and is built against the base of the one immediately above it, except the inner one, which stands upon the summit platform. The outer quadrangle stands on the lowest terrace. The measurements of the several buildings are indicated on the plan. They contained, in the aggregate, eighty-seven apartments, assuming the part in ruins to have corresponded with the parts preserved. The rooms are single or in pairs. A staircase upon the front and rear divides the building on these sides from the lower terrace to the upper. The dots in the apertures indicate columns, which are found in this and several other structures.

Attention has been called to the Pueblo of Zayi for a special reason. It seems to furnish conclusive proof of the manner in which these great structures were erected, and how the peculiar vaulting was constructed, which is the striking feature of the Yucatan and Central-American architecture.

Mr. Stephens found every room of the back building on the second terrace filled with masonry from bottom to top. He remarks that "the north side of the second range has a curious and unaccountable feature. It is called the *Casa Cerrada*, or 'closed house,' having ten doorways, all of which are blocked up on the inside with stone and mortar. . . . In front of several were piles of stones, which they (his men) had worked out from the doorways, and under the lintels were holes, through which we were able to crawl inside; and here we found ourselves in apartments finished with walls and ceilings like all the others, but filled up (except so far as they had been emptied by the Indians) with solid masses of mortar and stone. There were ten of these apartments in all, two hundred and

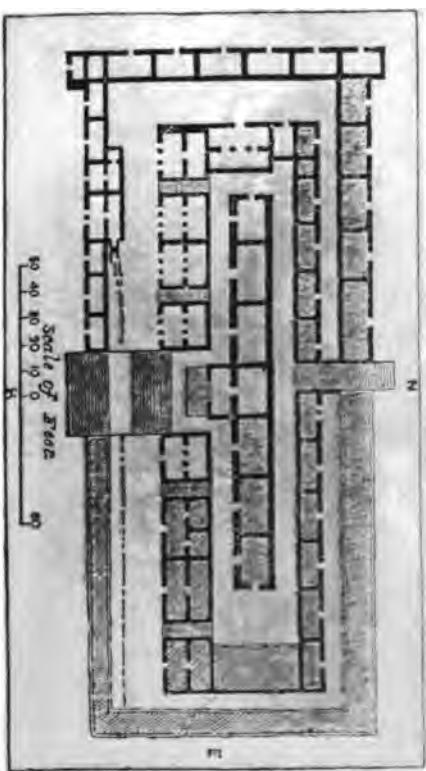


FIG. 23. PLAN OF PUEBLO OF ZÁVI.



twenty feet long and ten feet deep, which being thus filled up made the whole building a solid mass. And the strangest feature was that the filling up of the apartments must have been simultaneous with the erection of the buildings; for as the filling in rose above the tops of the doorways, the men who performed it never could have entered to their work through the doors. It must have been done as the walls were built, and the ceiling must have closed over a solid mass. Why this was so constructed it was impossible to say, unless the solid mass was required for the support of the upper terrace; and if this was the case, it would seem to have been much easier to erect a solid structure at once, without any division into apartments.”¹

It does not seem to have occurred to Mr. Stephens that the masonry within each room was a core, without which a vaulted chamber in this form could not have been constructed, with such knowledge of the art of building as the Indians possessed. It shows the rudeness of their mechanical resources, and the real condition of the arts among them; but at the same time it increases our estimate of their originality, ingenuity, and industry. They were working their way experimentally in architecture, as all other peoples have done, and they might well point with pride to these structures as extraordinary monuments of the progress they had made.

Several important conclusions follow:—

1. That these structures were built gradually, one building at a time, and were, so to speak, the work of generations.
2. That the “closed house” was the last constructed of the middle quadrangle of this Pueblo; and had not been emptied of its core and brought into use when the irruption of the Spaniards, in all probability, forced the people to abandon their Pueblo.

¹ *Incidents of Travel in Yucatan*, II. 22.

3. This would fix the period of its construction about A. D. 1520, thus settling the question of the modern date of this Pueblo; and also tending to remove one of the delusions concerning the antiquity of the Yucatan and Central-American houses of stone. This edifice is as much decayed as any other in Yucatan.

4. That these houses were without windows, fire-places, or chimneys, imperfectly lighted, and without ventilation.

The Mayas of Yucatan were organized in *gentes* or clans. This fact has an important bearing upon the manner in which their houses were occupied in the aboriginal period. Herrera makes frequent reference to the "kindred," and in such a manner, with regard to the tribes of Central America, as to imply the existence of a body of persons, organized upon the basis of consanguinity, much more numerous than would be found apart from *gentes*. Thus: "He that killed a freeman was to make satisfaction to the children and kindred."¹ This was said of the aborigines of Nicaragua: had it been of the Iroquois, who were organized in *gentes*, and among whom the usage was the same, the term *kindred* would plainly have been equivalent to *gens*. And again, speaking generally of the Mayas of Yucatan, he remarks that "when any satisfaction was to be made for damages, if he who was adjudged to pay was like to be reduced to poverty, the kindred contributed (a gentile usage). . . . They were wont to observe their pedigrees very much, and therefore thought themselves all related, and were helpful to one another (another gentile usage). . . . They did not marry mothers or sisters-in-law, nor any that bore the same name as their father, which was looked upon as unlawful."² The pedigree of an Indian, under their system of consanguinity, could have no significance apart from the *gens*. The family, in our sense, was unknown among them, and the names of brothers and

¹ General History of America, III. 299.

² Ib. IV. 171.

sisters would indicate no family connection between them. There was no possible way, under Indian institutions, by which a father and his children could bear the same name, except through a *gens*, which conferred a gentile name upon all its members. It would also require descent in the male line to bring father and children into the same *gens*. The statement also shows that intermarriage in the *gens*, among the Mayas, was prohibited. Assuming the correctness of Herrera's words, it is proof conclusive of the existence of *gentes* among the Mayas, with descent in the male line. The fact of this organization renders it probable that the apartments in these houses were occupied by groups of gentile kindred, as the houses of the Iroquois and the Creeks are known to have been occupied. The groups were separated from each other by solid partition walls, but the terraces were common to all.

The plan of domestic life in these houses, at the period of Spanish discovery, is imperfectly known. On a matter so eminently practical as the manner of living of the people, the first explorers and relators have given very meagre accounts. Herrera speaks of the houses in Yucatan as remarkable, but says only that there "were so many and such stately stone buildings that it was amazing; and the greatest wonder is that, having no use of any metal, they were able to raise such structures."¹ He also remarks upon the hospitality of the people as follows: "They are still generous and freehearted, so that they will make everybody eat that comes into their houses, which is everywhere practised in travelling."² From the ground plans of their houses it is plain that, while differing from those in New Mexico in form and mode of construction, they were the same in principle. Each family did not require a single house; and though, with our present knowledge, it cannot be positively asserted that the groups

¹ History of America, 2d. ed. IV. 162.

² Ib. IV. 171.

of families practised communism in living, yet it seems extremely probable that this was the case.

Stephens, at the time of his second visit to Yucatan, in 1841, found at least one case of communism in living, at a settlement near Uxmal, in a group of five hundred Maya Indians,—the veritable descendants of the Mayas who built the House of the Nuns, the House of the Pigeons, and the Governor's House. He made this discovery by mere accident, while among them to employ laborers. "This community," he remarks, "consists of a hundred labradores or working-men; their lands are held and wrought in common, and the products are shared by all. Their food is prepared at one hut, and every family sends for its portion, which explained a singular spectacle we had seen on our arrival,—a procession of women and children, each carrying an earthen bowl containing a quantity of smoking hot broth, all coming down the same road, and dispersing among the different huts. . . . From our ignorance of the language (Maya), and the number of other and more pressing matters claiming our attention, we could not learn all the details of their internal economy, but it seemed to approximate that improved state of association which is sometimes heard of among us; and as theirs has existed for an unknown length of time, and can no longer be considered merely experimental, Owen or Fourier might perhaps take lessons from them with advantage."¹ A hundred working-men indicates a total of five hundred persons, who were then depending for their daily food upon a single fire, the provision being supplied from common stores, and divided from the cauldron. This is, not unlikely, a truthful picture of the life of their forefathers in the House of the Nuns and in the House of the Pigeons, at the Pueblo of Uxmal, at the period of European discovery.

¹ *Incidents of Travel in Yucatan*, II. 14.

V. Little more has been done, with respect to the ruins in Yucatan and Central America, up to the present time, than the preparation of ground plans and elevations of a number of these structures, with detailed descriptions of the better portions of the work. For this we are mainly indebted to the labors of the late Mr. John L. Stephens, whose works upon these ruins are a remarkable monument of individual enterprise. But Mr. Stephens deceived himself with the imaginary conception that Yucatan and Central America were filled with cities in ruins; and he imparts this delusion steadily to his readers. It was an honest mistake, and very excusable at the time of Mr. Stephens's expedition. The greater part of the country was covered with a dense forest; thorough exploration was impossible with his limited force; the ruins were intrinsically highly remarkable; and he was unacquainted with the history and condition of the Sedentary Village Indians. In the preface to his last work he speaks of "visits to forty-four ruined cities, or places in which remains or vestiges of ancient population were found."¹ "Ancient city," "Indian city," "another city," "ruined cities," "great cities," are terms constantly used by Mr. Stephens in connection with these small Indian Pueblos. Every cluster of ruins was once a city of unknown extent, as well as of civilization and refinement, inhabited by a "mysterious people." "Close together," he remarks, "as we had found the remains of habitations, it seemed hardly possible that distinct and independent cities had existed with but such a little space between; and it was harder to imagine that one city had embraced within its limits these distant buildings, the extreme ones being four miles apart, and that the whole intermediate region had once swarmed with a teeming and active population."² Had Mr. Stephens been familiar with the manner in which the present Pueblos in New Mexico are located, and more especially those now

¹ *Incidents of Travel in Yucatan, etc.*, preface.

² *Ib. II. 81.*

in ruins, which were contemporary with the houses in ruins in Yucatan (as on the Rio Chaco, where seven distinct Pueblos are found in the same valley within an extent of ten miles¹), he would have had no occasion to be surprised at finding Pueblos four miles apart, and no ground for the absurd conjecture that the intermediate district of what he fancied was once one great city was occupied by the common people living in huts. There is no evidence that such a state of society as implied by Mr. Stephens's terms ever existed in Yucatan.

When Mr. Stephens and his accomplished draughtsman, Mr. Catherwood, first visited Central America in 1839, the explorations of Del Rio, and the later ones of Dupax at Palenque, were becoming known, and were exciting vague and high expectations in the public mind, which Mr. Stephens undertook to gratify by more extended explorations. Great cities in ruins, sculptures, hieroglyphs, palaces, temples, public buildings, and pyramidal elevations on which they were erected were mentioned freely in connection with these remains. A false terminology thus sprang up to stimulate the unwary reader, which has remained to the present time,—a most pernicious incumbrance upon American ethnology and archæology. A palace implies a king, or potentate of some kind, with power to enforce the labor of the people to build palaces for his exclusive use; a city implies numbers, a highly organized society, and stable subsistence; and civilization implies a high degree of culture and advancement. When America was discovered there were found two Pueblos of large size—that of Mexico and that of Cuzco in Peru—and a large number of small Pueblos, such as that at Palenque and at Uxmal; but there was no city, no palace, no civilization, and no State (*civitas*), as these terms are properly understood. The elements of civilization are

¹ Seven villages of the Mound Builders on the Scioto were found within an extent of ten miles.

gained only by immense labor, and outside of the Aryan and Semitic families it can scarcely be said at that time to have existed. It has become absolutely necessary, in order to speak of the tribes of mankind in an intelligent manner, to discriminate the ethnical condition of society according to relative progress.

Mr. Stephens, in his valuable works, showed a disposition to feed the flames of fancy with respect to these ruins. After describing the palace, so called, at Palenque, and remarking that "the whole extent of ground covered by those [ruins] as yet known, as appears by the plan, is not larger than our Park or Battery in New York," he proceeds: "It is proper to add, however, that, considering the space now occupied by the ruins as the site of palaces, temples, and public buildings, and supposing the houses of the inhabitants to have been, like those of the Egyptians and the present race of Indians, of frail and perishable materials, and as at Memphis and Thebes to have disappeared altogether, the city may have covered an immense extent."¹ This is a clear case of *suggestio falsi* by Mr. Stephens, who is usually so careful and reliable, and even here so guarded in his language. He had fallen into the mistake of regarding these remains as a city in ruins, instead of a small Indian Pueblo in ruins. But he had furnished a general ground plan of all the ruins found of the Palenque Pueblo, which made it plain that four or five structures upon pyramidal platforms, at some distances from each other, with the whole space over which they were scattered no larger than the Battery in New York, made a poor show for a city. The most credulous reader would readily perceive that it was a misnomer to call them the ruins of a city; wherefore, the suggestions of Mr. Stephens that "considering the space now occupied by the ruins as the site of palaces, temples, and public buildings, and supposing the houses of the inhabitants . . . of

¹ Incidents of Travel in Central America, Chiapas, and Yucatan, II. 355.

frail and perishable materials, . . . the city *may have* covered an immense extent." That Mr. Stephens himself considered or supposed either to be true may have been the case; but he is responsible for the false coloring thus put upon these ruins, and for the deceptive inferences drawn from them.¹

"When we attempt to explain the Palace at Palenque or the Governor's House at Uxmal as the residences of Indian potentates, they are wholly unintelligible; but as communal houses, embodying the defensive and communal principles, we can understand how they could have been erected, and so laboriously and elaborately finished. It is evident that they were the work of the people, constructed for their own protection and enjoyment. Enforced labor never created them. On the contrary, it is the charm of all these edifices that they were raised by the Indians for their own use, with willing hands, and occupied by them on terms of entire equality. And it is highly creditable to the Indian mind that, while in the middle period of barbarism, they had developed the ca-

¹ That honest men are in danger of falling into the trap so unguardedly set by Mr. Stephens is proved by the latest utterances respecting these Yucatan and Central-American ruins. My friend Prof. Charles Rau, the trusted archæologist of the Smithsonian Institution, turns these vicious suggestions of Mr. Stephens into positive assertions, as follows: "The buildings, on the whole, were either temples or dwellings for princes and other persons of rank. The common people lived near these structures in habitations of perishable character, all traces of which have long disappeared. Such an assemblage of substantial and frail structures may have constituted a Yucatec city in olden time." (Smithsonian Contributions to Knowledge, 1879, No. 331. The Palenque Tablet, p. 70.) With our present knowledge of the houses, institutions, and mode of life of the Village Indians, there is no justification for these assertions of Mr. Rau. They belong to the class of puerile conceptions, and their tendency is to stultify and disfigure American archæology. These structures are highly creditable to the intelligence of their builders, and can be made to reveal the actual progress they had made in the arts of life. It is to be regretted that views of this nature should be indorsed by such high authority as the Smithsonian Institution.

pacity to rear structures of such architectural design and imposing magnitude."¹

In this paper I have endeavored to present some reasons which render it desirable to send a competent commission to re-examine all these ruins of ancient houses, from the San Juan to the Isthmus of Darien. Such a commission should utilize the work already done in New Mexico, in Yucatan, and in Central America, and extend it wherever necessary. It should ascertain by actual exploration and investigation,—

1. The architectural style and extent of these ruins, and the ground plans of the principal structures.
 2. The condition of the art of masonry and of house construction, as shown by these ruins.
 3. The object and uses for which these houses were erected.
 4. The social organization, usages, and customs of the native tribes in New Mexico, Yucatan, and Central America, and, so far as possible, those of their ancestors, who constructed these houses.
-

LIST OF WORKS RELATING TO NEW MEXICO AND ARIZONA.

MARCOS DE NIZA.—A Relation of the Rev. Father Friar Marco De Niça, touching his discovery of the kingdom of Cevola or Cibola in 1539. Hakluyt's Collection of Voyages, Lond. Ed., 1600. Vol. iii.

French Version. Rélation de Frère Marcos de Niza. Collection of H. Terneaux-Compans. Vol. ix., p. 256.

¹ Johnson's Universal Cyclopædia. Article, "Architecture of the American Aborigines," Vol. I., 229.

CORONADO. — The Relation of Francis Vasquez De Coronado, Captain General of the people which were sent in the name of the Emperor's Majesty to the Country of Cibola, 1540. Hakluyt, Vol. iii.

Lettres de Vasquez Coronado, Gouverneur de la Nouvelle Galice, Coll. H. Ternaux-Compans, Vol. ix., p. 352.

PEDRO DE CASTAÑEDA DE NAGERA. — Rélation du Voyage de Cibola, enterpris en 1540 par Pedro de Castañeda de Nagera. Coll. H. Ternaux-Compans. Vol. ix., p. i. Paris, 1838.

JUAN JARAMILLO. — Rélation du Voyage fait à la Nouvelle-Terre sous les ordres du général Francisco Vasquez de Coronado, commandant de l'expédition. Rédigée par le Capitaine Juan Jaramillo. Coll. H. Ternaux-Compans. Vol. ix., p. 364.

GOMARA. — The Rest of this Voyage to Acuco, Tiguex, Cicuic, and Quivira, etc. By Francis Lopez de Gomara. Hakluyt, Vol. iii.

ALARÇON. — Rélation de la Navigation et de la Découverte faite par le Capitaine Fernando Alarçon. Coll. H. Ternaux-Compans, vol. ix., p. 299.

AUGUSTIN RUYZ AND ANTONIO DE ESPEJO. — A Brief Relation of Two Notable Voyages ; the first made by Friar Augustin Ruyz, a Franciscan, in the year 1581 ; the second, by Antonio de Espejo, in the year 1583, who, together with his company, discovered a land, etc., which they named New Mexico. Hakluyt, vol. iii.

The accounts of the events connected with the formation and history of the Spanish Missions in New Mexico, and of Spanish intercourse with the Pueblo Indians down to 1846, are scattered in various sources, and will be passed over. The connection of the United States with New Mexico, which formerly included Arizona and the southern parts of Colorado, Utah, and Nevada, may be stated briefly as follows : It was conquered from Mexico in 1846, was ceded by treaty in 1848, and has since formed a part of the United States.

JOSIAH GREGG. — Commerce of the Prairies, by Josiah Gregg. New York. Henry G. Langley, 1844. 2 vols., 320 p. each.

The author was the first to call attention to the Pueblos on the Rio Chaco.

EMORY, ABERT, ST. GEORGE COOKE, AND JOHNSTON. — Notes of a Military Reconnoissance from Fort Leavenworth, in Missouri, to San Diego, in California, in 1846-7. By Lieutenant-Colonel

W. H. Emory. Together with the reports of Lieutenant J. W. Abert and Lieutenant-Colonel P. St. George Cooke, and the Journal of Captain A. R. Johnston, United States Executive Document, No. 41. Thirtieth Congress, First Session, 1848. This volume contains representations of the Casas Grandes of the Gila, of the ruins of Pecos, Abo, and Valverde, and views of the Pueblos of Acoma, Santa Domingo, Santa Ana, and Noquino.

LIEUTENANT JAMES H. SIMPSON. — Journal of a Military Reconnoissance from Santa Fé, New Mexico, to the Navajo Country in 1849. By Lieutenant James H. Simpson. United States Senate Executive Document, No. 64. Thirty-first Congress, First Session, 1850.

This Report contains the first presentation of the ruins on the Rio Chaco, with ground-plans, elevations, and numerous plates.

CAPTAIN L. SITGREAVES. — Report of an expedition down the Zuñi and Colorado Rivers. By Captain L. Sitgreaves, Corps Topographical Engineers. Government Printer, 1854. Senate Executive Document. Thirty-third Congress, First Session.

This Report contains a view of a part of the Pueblo of Zuñi, and of a room in a Pueblo, with representations of the Zufians in costume, but the text contains very little explanation of either.

JOHN RUSSELL BARTLETT. — Personal Narrative of Explorations and Incidents in Texas, New Mexico, etc. By John Russell Bartlett. Appleton & Co., 1856. 2 vols.

LIEUTENANT JOSEPH C. IVES. — Report upon the Colorado River of the West, explored in 1857 and 1858 by Lieutenant Joseph C. Ives. Senate Executive Document, No. 90. Thirty-sixth Congress, First Session. 1859-60.

WHIPPLE, EW BANK, AND TURNER. — Report upon the Indian Tribes. By Lieutenant A. W. Whipple, Thomas Ewbank, Esq., and Professor William W. Turner, 1855. Explorations for a Railroad Route from the Mississippi River to the Pacific (near 35th parallel), vol. iii.

It contains a large amount of information concerning the Pueblo Indians and their languages.

HENRY R. SCHOOLCRAFT. — History, Condition, and Prospect of the Indian Tribes of the United States, by authority of Congress, in six vols., quarto, 1851-1857.

These volumes contain a large amount of information concerning the Pueblo Indians, with representations of some of their Pueblos, as Zuñi and Saguna; also of their costumes and languages.

W. W. H. DAVIS.—*El Gringo, or New Mexico and her People.*
By W. W. H. Davis. New York. 1857.

This work contains a large amount of very interesting information concerning the Pueblo Indians, from the commencement of Spanish intercourse with them. It has engravings of the two structures forming the Pueblos of Taos.

ALBERT GALLATIN.—*Transactions of the American Ethnological Society.* New York. 2 vols., 1845–1848.

These volumes contain much valuable information, particularly in Mr. Gallatin's essay on "The Semi-Civilization of New Mexico."

WILLIAM H. HOLMES.—*Report on the Ruins of southwestern Colorado.* By William H. Holmes. United States Geological and Geographical Survey of Colorado and Adjacent Territory, F. V. Hayden, Geologist in Charge. pp. 381–408. With numerous plates and illustrations. 1876.

Contains a full account of the Cliff Houses and Round Towers on the Mancos River in Colorado.

WILLIAM H. JACKSON.—*Report on the Ruins of the San Juan Region, with a Re-examination of the Ruins on the Rio Chaco,* with ground plans and numerous plates, by William H. Jackson. Id. pp. 409–449.

Contains much valuable information concerning the ruins in Colorado, with a full presentation of the ruins on the Chaco, and a restoration of the Pueblo of Bonito.

JOHN D. BALDWIN.—*Ancient America, in Notes on American Archæology* by John D. Baldwin, A. M. New York. 1872.

HUBERT H. BANCROFT.—*The Native Races of the Pacific States.*
By Hubert H. Bancroft. 5 vols. New York. 1874–76.

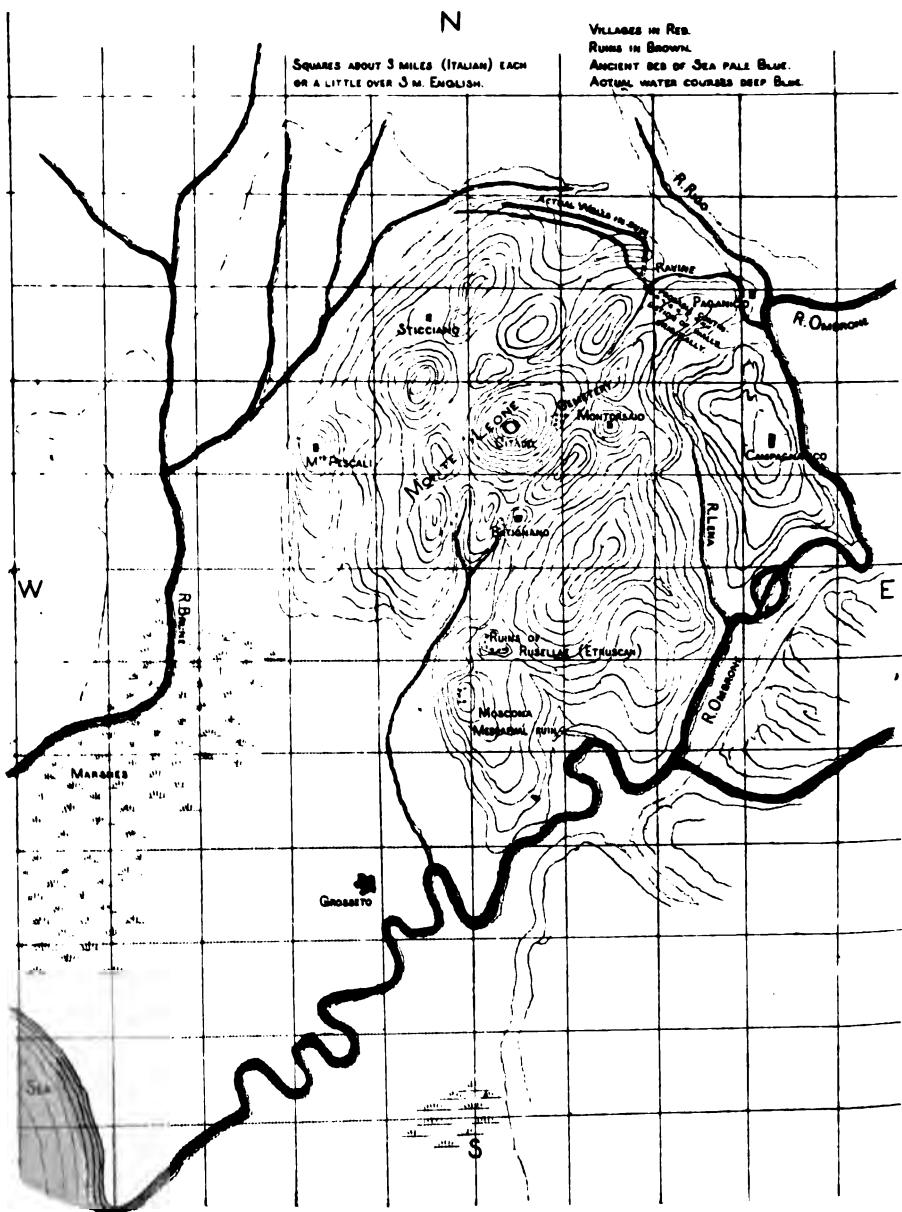
ANCIENT WALLS ON MONTE LEONE.

IN THE PROVINCE OF GROSSETO, ITALY.

By W. J. STILLMAN.







THE KODAK MANUFACTURING COMPANY LTD., BOSTON.

MAP OF MONTE LEONE AND ITS NEIGHBORHOOD.

ANCIENT WALLS ON MONTE LEONE, IN THE PROVINCE OF GROSSETO, ITALY.

*To the Executive Committee of the Archaeological Institute
of America:*

GENTLEMEN,—I have the honor to report as to the ruins on Monte Leone, in the Tuscan Maremma, that, having been informed by Marchese Salviati Corsi,—the proprietor of the estate on which the greater part of them lie,—that I had his consent to excavate on his land, and that if I would come to his residence at Monte Pescali, he would give me such indications and authorizations as would most facilitate my work, I accordingly visited him on March 3d, having the pleasure of meeting at his house the Count Bossi, whose acquaintance with the ground had been the means of introducing the ruins to the attention of Mr. Pullan, to whom and to his friend Mr. C. Heath Wilson, we are indebted for such information concerning them as we have hitherto possessed.

It was arranged that for facilitating my operations I should be quartered on the curate of the village of Montarsaio, on the Marquis's estate and within a few miles of the eastern termination of the wall. The Marquis placed at my disposal his head game-keeper, to whose intimate knowledge of the forest in which the ruins are I owe the easy and speedy accomplishment of my commission. The game-keeper was instructed to devote to me his time, and provide me with whatever I required in the way of workmen or implements.

We rode over the ground to make a preliminary examination, and to ascertain, if possible, the relation of the ruins to the topography of the district,—as I imagined from the description of the game-keeper, whom I found a most intelligent man, that the work in question must have been a defensive one, either of extreme antiquity or of late (Roman) date, the key to the solution being in the geology of the country; but that in any case there was no question of the remains of a city. Our first ride was to the summit of Monte Leone, whence, as from the highest point of land in the district, the whole topography could be made out and a portion of the ruins seen. I found that the summit itself was surrounded by a wall in ruin so complete that it was hardly possible to determine the breadth of the original construction. The stones, which were of all sizes under about four cubic feet, of irregular shape, and entirely unworked, were spread over the ground in a band forty feet wide, more or less, and formed a circle of about four hundred feet in diameter, drawn round the point of the mountain. The map I send, though not presented as a correct indication of the details of the topography, is so in all essential particulars, and will give a clear idea of the position of this work in relation to the rest, and of the whole problem involved.

It was clear from this bird's-eye view of the country that Monte Leone had once been a peninsula, and that the sea had—as we know from tradition to have been in part the case—once covered the plain where now stands Grosseto, and that it had washed the western slopes of the whole range, the highest point of which was that where the citadel stood; and I conjectured that the great lines of wall would be found to have extended from water defence to water defence, completing the circuit. The evidence on which this conjecture rests will be seen on reference to the map (which is corrected and enlarged from a geological map of the province, kindly

furnished me by the Secretary of the Commune at Grosseto, Signor Bertani), the present plain, once evidently submerged, being tinted pale blue, the present water-courses deep blue.

The next thing, then, was to trace the lines of wall and determine their character. They run, in great part, through impenetrable thickets, and even on foot it was impossible to follow their course throughout ; but this was by no means necessary. We went to the eastern termination, which is in a ravine that in the rainy season forms the bed of a torrent. Here a single wall starts from the north bank, but after a few yards it divides into two, one wall running due north a short distance, the other northwest, and then both, turning nearly westward, run with a varying interval to the northernmost slopes of the mountain mass, terminating in a complete dispersion of the stones near the alluvial deposit of the Bruna. The space between these two walls varies up to half a mile, as nearly as I could judge, having no means of measuring accurately.

These walls are composed of stone in its natural state and evidently collected on the spot, as it corresponds exactly with the stone of the torrent-beds which cross or approach them. I found one portion only where the original width was preserved, and there it measured about ten feet ; and from the mass of the stone (an excavation to the foundation uncovering about five feet of perpendicular wall still standing) I conclude the walls to have been about ten feet high at the least, possibly fifteen. There is no such order in the masonry as Mr. Pullan supposed, stones of all sizes being found in the faces and in the centre of the wall, the largest weighing about two tons by the estimate of the game-keeper, and measuring about $6 \times 6 \times 3$ feet. There was no careful facing of the stones, and there was no attempt to fill up the inter-spaces of the larger ones with small stones fitted to them, as in Pelasgic or Etruscan work.

On examining the ground on the east side of the ravine, I found, as the game-keeper had informed me, that there was no trace of the wall, but observed two good reasons why it should be wanting,—one in the nature of the ground, which was comparatively destitute of surface stone, and the other in the arable nature of the soil, which is mostly now, and was all, according to tradition, once under cultivation; so that stone was not only more difficult to obtain in such quantities as are employed on the west side of the ravine, but if formed into a wall would long ago have been dispersed by the processes of agriculture. On the west agriculture has been impossible, as the soil is untillable from its rockiness, and is covered by a wood of centuries' growth, probably the successor of an immemorial and primeval forest. As the wall to the west of the ravine is of too great importance not to have been the serious work of a large tribe, consisting as it does of about eight miles of a double line such as I have described, or about sixteen miles in all of wall, with a minimum section of one hundred square feet, we are perfectly justified in concluding that it was carried out by the construction of some similar work on the east side, either in earth, stone, or wood; but in either case this continuation would long since have disappeared, so that its absence does not militate against my conclusions,—which were that this was a work of defence, constructed by some party of immigrants by sea, which landed on the shore of Monte Leone, and defended itself in this way against a more barbarous people on the mainland.

That the epoch of this settlement was very remote, coinciding with the entire submersion of the plain, is indicated by the fact that the wall extends from the alluvium on one side towards and nearly to that on the other side of the ancient isthmus of Monte Leone, and that as a defence it would have been useless if it could have been turned by land on either side, as it might have been in any historical

times ; while on the ancient sea-shore there is nowhere any indication of a flanking work.

That the people who inhabited the main land were more barbarous is made probable by the fact that such walls, which would have yielded to the simplest siege engineering, were allowed to be completed by an invading force, and were considered sufficient for defence ; and by the consideration that any higher civilization would have possessed the means of turning all these defences by shipping. Furthermore, the ruins of Rusellæ, unmistakably a Pelasgic town, stand on a hill inside the enclosure ; and the wall would have been an absurdity if Rusellæ already existed ; while, if constructed by the Pelasgi, it would have been more complete in its structure, and would not have been in such complete ruin, since the walls of Rusellæ are in excellent preservation. But the Pelasgi were the first European people to whom we have any right to attribute scientific wall-structure, or who developed the arts of civilization to a point at which their results obtain a permanent character and identifiability. The presence of a Pelasgic city behind this line of defence, therefore, proves its priority of construction even if its structure did not, and gives it an antiquity consistent with my hypothesis that it originally ran from water to water.

The examination of the ruins by excavation gives no result to shake this conclusion. I excavated the citadel, which is clearly contemporary, to the bare rock in two places, and found nothing but fragments of the rudest pottery, and these greatly corroded by action of moisture,—a double indication of great antiquity. No trace of any habitation exists within the enclosure except the ruins of a mediaeval convent on one of the peaks,—no traces of brick or collections of domestic *débris*. At several points within the enclosure are isolated remains of sections of walls similar to the enclosing, but these I conclude, from examination of one of them, to mark the site of cemeteries.

That which I examined I found to be composed of isolated heaps of rough stone, apparently surrounded by a wall, but all in such utter dispersal that it was impossible absolutely to determine. I opened the best preserved mound to the bottom, but found only fragments of rude and corroded pottery ; yet about a foot from the top I came upon a fragment of pottery of a decorative character, apparently early Etruscan, if we can distinguish that from Pelasgic. The extreme antiquity evident in every indication decided me that any further quest was useless ; the more so as the mounds were heaped up on a rocky soil, and had sunk into it, so that it was impossible, except by the indications of pottery, etc., to know when we were at the bottom of the tumulus.

Another point demonstrating the antiquity of the remains is the entire absence of any local name or tradition connected with them. If they had been as recent as the Roman conquest, there must have been a name by which to identify them. I was informed that there were some vestiges of construction in the valley about midway between the walls and Paganico, commonly known as the Bagnarolo, though nobody knew why ; and on investigating them I found in fact, not far from a large spring, the substruction of a building evidently a small bath ; and as fragments of tiles and bricks of imperial fabrication are found scattered over a field a quarter of a mile away, and as a bronze coin of Augustus found there was brought us, it was clear that a villa had stood there in the imperial epoch, of which the bath had formed an appendage. But as it now is surrounded by forest, and has evidently been in ruins for centuries,—the substruction of the villa, standing on arable land, having utterly disappeared,—the fact that the name still clings to the locality makes it in the highest degree improbable that this much more important work, if of post Roman date, could have been so completely lost to legend as it is. I have never known a case in which ruins

even two thousand years old had lost all traditional recognition, in appellation or legend.

Having arrived at the conclusion I have stated, I judged my mission concluded, and that I was not justified in spending more of the Institute's funds in amplifying evidence already as clear as the nature of the case admitted; and, satisfied that any further investigation by excavation was entirely useless, I returned to Grosseto, having been at Montarsaio a week only. I was invited to continue excavation at Rusellæ, and the Secretary, Bertani, had obtained the necessary permission; but I did not consider myself justified in beginning a work which might become very serious and important, without the authorization of the Institute, though I had expended only a small part of the funds in my hands. That the expense was so small is due to the kindness of Marquis Salviati Corsi and the advantage of the guidance of his keeper through the intricacies of this vast forest; and to the great interest of the Marquis in the investigation I owe my being placed in a position to pursue it in comfort and even with great pleasure, and I take the opportunity to express thus publicly my obligations to him, and to thank Mr. Pullan for having asked the Marquis to extend to me a permission already accorded to himself.

I found photographic illustration impracticable from want of definite features and recognizable construction, as it was only by the continuance and plan of the remains that they could be distinguished from a chance heaping up of stones to clear the land, such as one sees continually on rocky land that has been reclaimed.

If I might suggest an attribution of the ruins at Monte Leone, I would do so, tentatively rather than confidently however, with the conjecture that they mark a colony of the Umbri. Pliny speaks of the Umbro, the modern Ombrone, the river which runs to the east of Monte Leone, as "navigiorum capax, et ab eo tractus Umbriæ." Dennis, in his "Cities and Cemeteries of Etruria" (Vol. II. p. 235,

second edition), gives the citation, adding that "Cluver (II. p. 474) thinks, from Pliny's mention of it [the Ombrone], that it gave its name to the Umbrians; but Müller (Etrusk. Einl. 2. 12), on the contrary, considers it to have received its name from that ancient people, and interprets Pliny as meaning that a district on the river was called Umbria." Is it not possible that this settlement, large enough for a considerable principality, may be accounted for according to Cluver's interpretation, and be the original settlement of the Umbri, of whom we only know that they lived in cities? No other work of the kind being known in Italy, its extent, its location on the Umbro, and its being in fact the only ancient indicated site on the Umbro, and unmistakably, as I think I have shown, anterior to the Pelasgi, the indications are rather in favor of this conjecture than against it. I submit the problem to the judgment of more experienced archæologists.

Yours respectfully,

W. J. STILLMAN.

FLORENCE, March 20, 1880.

ARCHÆOLOGICAL NOTES ON
GREEK SHORES.

I.

By JOSEPH THACHER CLARKE.



ARCHÆOLOGICAL NOTES ON GREEK SHORES.

I.



POSEIDON, FROM A VASE.

THE wanderer who approaches the lands which the ancient Greeks ennobled by their civilization by way of the Danube, that great natural highway from Central Europe to the East, passes many traces of the extended Roman Empire before reaching the most remote Hellenic colonies. It would appear that Rome was destined to be in every way the first medium between Greek life and its regeneration in modern times. That powerful nation of subjugators and lawgivers covered Hungary, Servia, and Bulgaria with their works of civil and

military engineering; the maps of Southern Germany, Austria, and Turkey under Roman dominion show the banks of the Danube dotted with their settlements. The Latin and sometimes the Greek names of over fourscore towns upon the river are handed down by the historians of the empire and by inscriptions. The situation of these can almost always be determined,—indeed, their modern names are often directly derived from the Latin; but in the majority of cases little more than the position, and the fact that at these stations such and such portions of the well-regulated Roman army or fleet were quartered, is known concerning them.

Had the Danube been navigable up to Vindelicia or Germania Magna from its mouth, or even from points of its lower course nearer and more readily accessible to Rome than those transalpine provinces, it would have been of incalculable importance to the empire; but the difficulties and dangers of the stream between Komorn and Stranting have only in part been overcome by gigantic works of modern engineering,—the blasting of the Strudel and Wirbel near Grein, and the partial regulation of the many beds which its rushing waters have furrowed between Linz and Gönyö. As it was, the Roman stations upon its banks were too distant and difficult of approach from Italy ever to be much more than military posts in a foreign land.

Ratisbon — Castra Regina, whence Regensburg — was as important as any of them, and boasted of an oracle of local fame and a garrison of three legions. Founded by prominent Roman families, it was early the seat of a commerce down the stream, this being the highest point at which the river is generally navigable. This commerce continued to increase long after the life of the state which founded it, until, at the time of its greatest profit and extension, it received a death-blow by the discovery of the sea-route to India, which made a revolution in

all mercantile transit connected, however remotely, with the Black Sea. The Roman settlement here was upon both sides of the river, as to-day Ratisbon and Stadt-am-Hof; but in its lower course the Danube was, with the exception of the few years during which Dacia was under Roman dominion, the very boundary of the empire, and ancient towns were exclusively upon its right bank. The remains of Roman work which are here and there unearthed are generally too fragmentary to be of value; they seldom amount to more than a mosaic pavement or the foundation walls of a public bath. All such discoveries are, however, diligently published by the many local societies.

A few ancient fortifications and subterranean passages are visible at Ofen,—the fortress Aquincum, by which the emperors held the wide-spreading Hungarian lowlands in subjugation,—but the most interesting Roman constructional works are not found until the mighty stream breaks through the range of Transylvanian Alps which forms the natural barrier between the Turks and remaining Europe. The highway which Rome was obliged to maintain in connection with the colonies beyond these mountains, Pannonia and Dacia,—a road especially necessary because the cataracts of Islatz and Jachtalja render communication by water almost impossible,—had followed the course of the river from Singidunum at the mouth of the Save. The little island opposite Belgrade is still called Sigin by the inhabitants. When this road came to the rocky range it entered the Kazan, one of the grandest passes of Europe; its continuation here, along the side of upright cliffs, was a mighty undertaking, planned as early as the time of Tiberius. The work was not, however, begun at that time, owing to the extreme difficulties of its execution; nor could any progress be expected during the feeble rule of Domitian, although that cruel emperor greatly needed a secure communication with the provinces of the

lower Danube, especially on his hurried return to the luxurious delights of Rome after his disgraceful Dacian peace. The long-planned highroad was imperatively necessary before the opening of Trajan's carefully prepared Dacian campaigns; and Trajan, whose taste for the imposing architectural magnificence of his time is so evident in less remote parts of the empire, left in its construction a memorial of his reign which can never be obliterated. On the face of the cliff, which often rises perpendicularly from the water's edge, a gallery road was partly built and partly excavated through the mountains where the upright sides offered no foothold along great distances of the river's course.

A ledge-way, seldom broader than two metres, is hewn into the rock, and this was eked out by a wooden platform, built upon brackets and overhanging the water. The sockets for the ends of the supporting beams are visible in the cliff, just above the highest mark of spring freshets; they may be traced for kilometres, neatly cut at regular intervals. At the narrowest point of this contraction of the stream,—a width given by Austrian surveys as 110 metres,—there is cut in the face of the cliff the well-known tablet, with the inscription commemorative of the completion of the road, dating it in the third consulate of the emperor, 100 A. D. The macadamized *chaussée* upon the opposite bank, which has cost the Austrian Government so much labor and expense, offers a striking example of the superiority of modern engineering construction, a superiority arising almost entirely from the many means now available which were unknown to the ancients. The natural difficulties offered by the Servian shore seem greater than those of the left bank; but the Romans were obliged to build their road upon their own southern side of the river. The stream could be crossed by a fixed bridge only at some distance below the pass. Two bridges of boats, represented upon Trajan's Column, were thrown across the

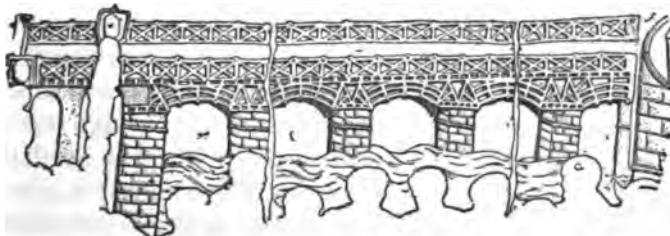
Danube during the Dacian campaigns, one of them in the pass itself at Taliata, probably the present Columbina, a place naturally fitted by the width and current of the river for the anchoring of pontoons. But a fixed bridge, expensive as the experiment must subsequently have proved, was imperative for the success of Trajan's vast plans. The pontoons were useless at times when the stream was frozen or became impassable from masses of floating ice.

It is impossible to explain the building of a fixed bridge on other grounds than the fear that the Dacian colony might without it be cut off from the mother country and exposed to a concerted and overwhelming attack of the barbarians. A few miles below the town of Fetislam the site of the structure is still marked by the remains of buttresses upon either bank, by the foundations of flanking towers, and by the crumbling stones of sixteen of the river piers, which may be seen at exceptionally low water. The position chosen for the bridge was in every respect admirable. It was the first spot after the river leaves the mountain defile where the plains on either side allowed the foundation of a commanding town, Egeta, and afforded space for such a mustering of the passing armies as would assure regular and orderly advance, and prevent the great bodies of troops and their cumbrous accompaniments from becoming blocked on the bridge-way or landings. It is also the highest part of the course of the Danube to which vessels can ascend from the mouth; the Iron Gate is to-day an almost insuperable obstacle to the commerce upon the river, and in some seasons is entirely impassable by the lightest craft. Egeta is especially mentioned as a station of the Roman fleet of the lower Danube, which was there at the nearest possible point to Rome. The land at this spot was well adapted to the building of the bridge; the stream had but just left the mountains, and its course was fixed; it had

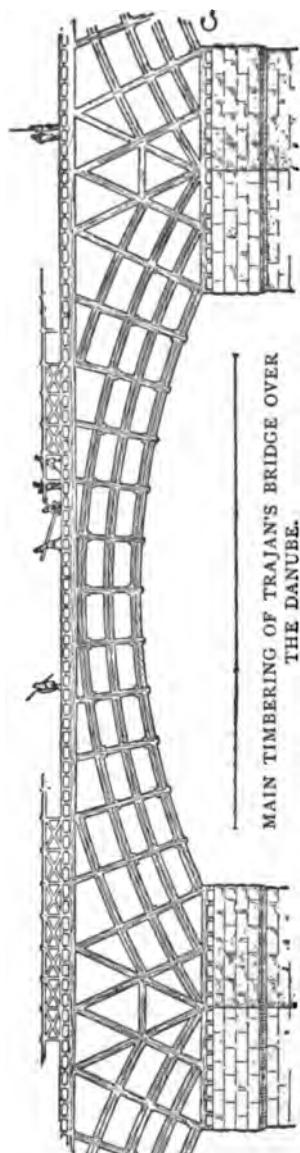
not yet descended into the swamps of the country below, where the banks — a broad expanse of marshes — are subject to annual inundations, and the many channels of the stream to continual shifting. The bed was here sufficiently broad, however, to form a sand-spit in the centre, exposed at low-water mark, and of great assistance to the primitive pier builders. The width from bank to bank at this point is 1130 metres, very well agreeing with the measure of 3570 Roman feet given by Dio Cassius in his account of the bridge,—a description which, from the writer's official position as consul and legate in Upper Pannonia, was likely to be correct. The river was nowhere over six metres deep, while, only a short distance above this point, the depth exceeds ten times that sounding. The piers could be much more easily founded upon the gravelly bed here than upon the rocks of the mountainous upper course. The chief force of the stream could be shifted, with the assistance of the spit, from side to side of the broad bed by moving the sand-shoal in the desired direction by means of dams and breakwaters, increasing it upon one side and turning the tearing current upon the other. To cross the expanse, more than two thirds of an English mile, twenty piers of masonry were necessary, supporting a bridge-way of timber-framing. The foundation was effected, after the force of the water had been diminished, by driving piles and placing upon them a coffer-dam (*κιβώτιον*), stated by Tzetzes to have been one hundred and twenty feet long and eighty feet wide, dimensions somewhat greater than those of the masonry of the imposed piers.

In the winter of 1858 the waters of the Danube sank to such an exceptionally low level that a survey and examination of the remains were undertaken by the Austrian Government. The piles were found to have been of oak wood, encased, as deep as it was possible to excavate between them, by a cement. The ruins of the

masonry were so irregular that the exact plan and dimensions of the piers could not be accurately determined; but from the representation on Trajan's Column it seems evident that their profile was pointed. The masses measured by the Austrians vary from fourteen to fifteen metres broad, and from twenty-two to twenty-three metres long; the piers were built on centres 53.82 metres apart, the actual opening apparently having been 34.85 metres. The stumps show a facing of quarried stone with a filling of rubble work. The height of these piers is unanimously stated by ancient writers as one hundred and fifty feet, exclusive of the foundations. This seems excessive, but perhaps is not impossible. The wooden bridge-way was to be protected against attacks, especially of fire, from vessels passing below. The Romans were accustomed to high piers: Trajan's bridge over the Tormes had piers one hundred and four feet high, and those of the bridge over the Tagus are stated by various authorities as one hundred and fifty and one hundred and seventy feet high. The banks upon either side of the Danube at this point would not have required much terracing to reach this elevation; perhaps this may be regarded as one additional advantage of the site. The bridge-way, of a triple timber arch and bracings, which rested upon these piers of masonry, is represented not only on Trajan's triumphal column in Rome, but also upon a commemorative medal of no excessive rarity.



REPRESENTATION OF THE FIXED BRIDGE OVER THE DANUBE
UPON TRAJAN'S COLUMN, FROM A CAST.



pleted, and this economy of labor and material, usual in

It is incomprehensible how prominent archæologists could have supposed the bridge-way to have been formed by masonry arches. The entire bridge was completed between the two Dacian campaigns; its building could have occupied only two seasons. The completion of the wooden framework of the bridge in so short a time is wonderful enough, and is to be explained only by the admirable distribution of the work among a multitude of workmen. It is contrary to common-sense to suppose that all the Roman legions that were ever assembled in the lands of the Danube could collect the materials and arch the enormous masses of masonry that would be necessary to span twenty-one openings of thirty-five metres each,—not taking into consideration the difficulties of putting up so many centrings in so short a time. All the arches would have to be under way at once, in order to finish them and the remaining support and superstructure of the bridge in so short a time; it would not have been possible to move one or two centrings from pier to pier as the arches were successively completed, and this economy of labor and material, usual in

the construction of stone bridges, is not compatible with the limited number of working-days in two summers. But it seems needless to waste arguments upon the matter, in view of the adequate illustrations of a wooden bridge-way upon the triumphal column and the coins. These representations naturally are not architecturally exact; they merely exhibit the main characteristics of the masonry and carpentry work, exaggerating and omitting according to the manner of all painters of vases, cutters of coin-dies, and painters of wall decorations who attempt to represent buildings. The buildings shown in the frescoes of Pompeii bear much the same relation to ancient temples and dwelling-houses as the relief upon Trajan's Column bears to the bridge over the Danube. The details are either left out entirely, as is the case with all the cross-bracings and the continuation of some of the principal beams over the piers; or are disproportionate in size, as the immense balustrades bordering each side of the road-way, which is shown in native perspective as from above; yet the character of the structure is expressed in so clear a manner that the chief lines of a restoration are certain. The timber arches could easily have been prepared simultaneously upon the river-banks from the abundant material of neighboring forests; they were framed of comparatively small beams, which could be easily transported to their position.

The type of bridge adopted by Trajan is one in common use at the present day. In our own country are several wooden bridges of wide span erected upon piers of masonry, which well illustrate the constructive principles adopted by Trajan. The bridge of three segmental arches, 59.4 metres span, over Mill Creek near Cincinnati, the well-known arch over the Connecticut River at Bellows Falls, 53.3 metres span, and above all that magnificent specimen of engineering carpentry, the Cascade Bridge of the Erie Railroad, with its span of 83.8

metres, may serve as examples. Smaller European bridges — that of the Zarskoje-Selo Railroad near St. Petersburg, or that over the Murg at Rastadt — are still better parallels of the method of construction which was employed nearly eighteen centuries ago for the bridge over the Danube. It would appear from the coins that, when the bridge was finished, a triumphal arch was erected, according to the custom of the Romans after the completion of works of this importance.

Perhaps no ruler ever built so many bridges as Trajan. Besides this gigantic structure and the two pontoon bridges over the Danube, the celebrated bridge over the Rhine at Mayence, those over the Metaurus and Aufidus in Italy, and over the Tamega, the Tormes, and the Tagus in Spain, as well as a number of others, date from his reign. Trajan's two great delights — delights characteristic of the Roman temper — were carrying on wars of conquest and building colossal structures, generally of greater engineering than architectural excellence. Both of these were expressed in the construction of the fixed bridge over the Danube, and it is more than a mere coincidence that its erection marked the very culminating point of Roman dominion. Trajan's bridges, and this one more than any of the others, made his reign proverbial in later times for constructive magnificence. He was certainly the greatest of the imperial builders. It was not mere flattery which stamped on the coin commemorating the building of the bridge the verdict of the Roman people, — *Optimo Principi.*

The architect of the bridge was Apollodorus of Damascus, the designer of Trajan's Forum with its triumphal

arches and column, and of the Odeum and Gymnasium. It is interesting that a fragment of one of these structures — a bas-relief representing the architect, a man in Greek costume, handing to the seated emperor a roll of drawings — is preserved by



a happy chance upon the upper part of Constantine's triumphal arch. During the reign of Trajan, Apollodorus seems to have executed the chief monuments suggested by the emperor's lively interest in his art; but his unsparing criticism of Hadrian's architectural attempts was very unfavorably received by that imperial amateur, and led to the exile and subsequent execution of the master. Hadrian destroyed the great bridge which had cost his predecessor so much labor and expense, avowedly because the advancing hordes of barbarians threatened the colonies upon the right bank of the Danube, and this bridge would serve them as a welcome transit. It may, however, be possible that the jealous emperor was the more willing to make this sacrifice because he was aware that he thus destroyed one of the greatest works of his predecessor and of Apollodorus, who had fallen into so signal disfavor. Other accounts of Hadrian's regard for the achievements of Trajan's reign lend some weight to this uncharitable supposition. As it was, the structure was in use less than two decades, the piers of masonry alone being left as a memorial of its builders. Constantine the Great made a hasty restoration of the wooden bridge-way upon the partially overthrown piers, when he crossed the river on his expedition against the Goths. A tower of his construction is said to have stood at Egeta; the statement that he built a bridge upon piers at Oescus seems to be an error that had its origin in this reconstruction, especially as no remains of bridge-piers or buttresses exist at the site supposed to be identical with Oescus or at any other point of the river-bank. Trajan's bridge below the pass of the Iron Gate was thus the only fixed bridge that has ever spanned the lower Danube. We learn from Procopius that Apollodorus wrote a monograph upon his bridge,—a work now lost; a few fragments of it, which point to the manner of construction above explained, are to be found in Tzetzes. Only one of the professional writings of the architect has been pre-

served, and this is upon a subject of little general interest; namely, engines of war.

The architectural literature of antiquity must have been extensive, as it seems to have been customary for ancient architects to explain in an essay the principles which guided them in planning an edifice, and the peculiar methods of construction which were necessary to accomplish its erection. It is an incalculable loss that not one of these special descriptions of the buildings of antiquity has been preserved. To possess the original treatises concerning the Parthenon, the Temple of Ephesus, and Trajan's Forum, by Ictinus, Hermogenes, and Apollodorus would be an advantage to architectural science of which it is difficult to form an estimate. How much that is slowly, laboriously, and after all imperfectly gained from the ruins would lie clearly before us in these writings! How many conceptions, of which modern architects are absolutely ignorant, might be added to our knowledge! From the shattered stones it is difficult fully to understand the optical refinements universally practised in antiquity. The very fact of the existence of the curvatures in Doric temples has been known but a few years. How recent and how incomplete is our knowledge of the powerful part taken by color in ancient architecture! We have but a vague idea of its different use in the Doric and Ionic styles of building. The practical treatment of stone-work in the fifth and fourth centuries B. C., as judged by its results, has not been approached in excellence with all the appliances of modern science. The loss of these Greek treatises upon special buildings and technical subjects cannot be too much deplored.

Before leaving the range of the Transylvanian Mountains, where the rich veins of metal and coal were the wealth of the Dacians long before the Roman conquest, it is interesting to notice the mines which the Romans began to work at various sites, shafts cut by hand-tools in

the hardest rock, the sides of the passage being as straight and smooth as though built of quarried and polished stone. The formation is so hard that it would not now pay to attack it with blasting. Many weary lives must have been spent in these mines, which were worked almost entirely by criminals and political prisoners condemned to them (*ad metalla damnavi*) at the time when Trajan attempted forcibly to populate these Danubian provinces.

In the broad-stretching plains of the river's lower course there are but few traces of antiquity. The Ister was on the very outskirts of the ancient world. A few remains of ramparts and the foundations of walls and fortifications at Siliestria and Chernavoda, which once afforded a feeble protection against the savage tribes beyond its stream, and in the barren and untenable Dobrudscha, are almost all that is left of Roman occupation. The Greeks seldom penetrated to its banks before Trajan led so many of the inhabitants of the Roman province Achaia across his great bridge that their language became a common dialect of Dacian cities. Homer knew that the river had its source in the West, but it was always a stream of the Hyperboreans to the older Greeks; down to quite a late period their geographers conceived that it emptied in part into the Adriatic, by which roundabout way one version of the legend related the return of the Argonauts from Colchis to Greece. In the third and fourth Christian centuries, vast hordes of nomadic Goths rushed from the plains watered by the stream to overthrow the remaining fane and public monuments of Greece and to extinguish the last flicker of Hellenic refinement in the unfortunate land.

In an isolated earlier instance the Danube had been of momentous importance to Greek history. The power of the Persians, which so soon afterwards threatened Greek freedom and culture with annihilation, was once on its banks entirely at the mercy of the Ionians. The great attack of Asiatic despotism upon European liberty

and civilization had been planned in its main aspects when Darius, at a date towards the end of the sixth century not accurately to be determined, crossed the Danube to advance with his army into the wild Scythian territory, on a most unwise expedition against that elusive people. The king had marched with a mighty land-force through Thrace. His fleet of six hundred ships, furnished and led by Asiatic Greeks, had been ordered to sail from the Bosphorus to the Danube, and, after advancing two days' voyage up from the mouth, to build with their vessels a pontoon bridge across the stream. This was done at the site of the later city and fortress of Noviodunum, between the present villages of Isaktchi and Tultcha,—the last point of the river's course where its waters, augmented by those of the Pruth, are not yet divided into the many arms by which it empties into the sea. Greek artisans built the bridge here, as they had a short time before built that over the Bosphorus. They were architects and constructors for the Persians, as they were in later times for their Roman conquerors. Mandrocles and Apollodorus built the world-famed bridges for the passage of the foreign armies which threatened or had enslaved their countrymen. Though the chief designers of the pontoon bridges of Darius over the Danube and of Xerxes over the Hellespont are not known by name, it is certain that they were Greeks. Arrian describes the method of building these bridges of boats: the vessels were floated down the stream from a point somewhat above that to be crossed; they were guided stern-foremost to their destined position, where they were anchored by throwing out a conical basket of woven osiers, filled with stones and attached by the circular rim, that seems to have served as a fluke and caught readily upon the bottom, which at the part of the Danube where these bridges were set affords exceedingly good holding-ground. Upon the boats, thus arranged and fixed in position, connecting

beams were laid, upon which boards were placed crosswise, and the passage-way was secured by a balustrade.

The pontoon bridge built by Darius could not greatly have differed from those represented upon Trajan's Column. Over it the immense Persian army advanced into the present Bessarabia. From the original instruction of Darius to the Greeks to break down the bridge and follow him upon his expedition with the men of the ships, it is evident that it was his intention to return to Persia by marching entirely around the Black Sea, of the dimensions of which the vaguest ideas must have been prevalent. Such was the ancient understanding of geographical distances and of the nature of the country to be traversed,—the barren steppes and swamps of Russia and the mountains of Caucasus. It was only upon the advice of one of the Greek generals that the bridge was suffered to remain after the first crossing of the army, and Darius was even then confident of success if he was not repulsed in two months. The story of the cord of sixty knots, significant of the days to be waited by the Greeks, the return of the retreating Persian army in the night to the partially destroyed bridge, and the efforts of the stentorian Egyptian herald to attract the attention of Histiaeus the Milesian is told by Herodotus with his usual simplicity and with exceptionally vivid interest. Enticed and harassed by the nomadic Scythians, who, retreating to the north with their wives and children upon their wagon-homes, avoided an open encounter and systematically wasted the country behind them, the army in vain attempted to shelter itself by throwing up fortifications by the river Oarus. It has been recently thought that these defences may be recognized in some breastworks near the town of Saratow, a spot which would thus mark the extreme advance of the Persians. Finally forced to a retreat, pursued by the whole Scythian nation, the fate of the Persian army depended upon the bridge left in charge of the Greeks. Detained beyond the sixty days fixed for the

return, the retreating army was preceded by a body of Scythians, who endeavored to persuade the Greeks to destroy the bridge and recover their independence by the consequent extermination of the Persians,—an opportunity which was lost through the personal selfishness of some of the Ionic governors, who supported Darius that they might maintain their own unpopular rule. The entreaties of Miltiades, the future victor of Marathon, were in vain. But the temporary diversion of the Persian force from rapidly advancing on Greece was sufficient to render this foolish expedition indirectly advantageous to Hellenic civilization, and to make the future victories of Greece over Persia more easy than they would have been without this exhausting delay.

Noviodunum was a place of some importance down to the latest ages of the empire; it was the station of a Roman legion, and the fortifications were restored and extended by Justinian. The river was for a second time bridged by pontoons at this spot during the expedition of Valens, the younger brother of Valentinian, against the Goths in 369 A.D. The *Sanctum Ostium*, the principal southern arm of the Delta, is now the Holy Mouth of St. George. Had the extensive works of engineering which, largely from political reasons, have recently been devoted to the Sulina outlet been applied to this arm, it would be, as of old, the most important as well as the broadest outflow of the mighty river.

It was this branch which was chosen for the exit of our little vessel; for although the course of the St. George among the marshes is so tortuous as to be nearly twice as long as the Sulina arm, it yet saves thirty-five kilometres of the dreaded sea-coast. The land encroaches at the estuary, where sand-banks, dangerous to approaching vessels, are formed; but the fear which ancient geographers entertained that the Black Sea would, little by little, be entirely silted up by the alluvium of the many streams which

empty into it, and become so shallow as to render marine commerce totally impracticable, seems groundless.

It must not be supposed, from this rather amusing misconception, that the Greeks, who have ever been a nation of sailors, were not familiar with the Black Sea from their earliest history. Even in mythical ages it was the scene of famous adventures. Past this Delta sailed Orestes and Pylades to the Scythians, whose shrine of Artemis was tended by the daughter of the great Agamemnon. The shores of the Tauric Chersonese and of Colchis were familiar to the Greeks in their oldest legends. Though told with great poetical imagination and license, these tales have a circumstantiality which attests, if not their absolute truth, at least the full acquaintance of the relators with the marked peculiarities of the sea and its shores. To consider the kernel of such accounts as groundless fable is to attribute unlikely inventions to the Greeks. It seems not improbable that many of the scenes of the *Odyssey* were drawn from the nature of these shores. Wonders peculiar alone to the Pontus were related by Homer, who was familiar with the legends of the Argonauts and of Heracles. Circe was the sister and Medea was the daughter of Colchian Aietes. The Black Sea was early the scene of predatory expeditions for the valuable products of its coast lands; Jason was professedly in pursuit of gold. It was the practice of the inhabitants of Colchis, down to a late historical period, to stretch fleeces of wool across the beds of the torrents which fall from the mountains of Caucasus, with their rich veins of ore, and by this means to entangle the particles of gold washed down by the stream,—a mode of collecting the precious metal still in vogue in the rivers of the African Gold Coast. As the advance of civilization rendered a settled commerce possible, the products of these lands were naturally an attraction for countless Greek vessels. The

broad-spreading plains which border the Black Sea are by nature complementary to the sunny rocks of the Peloponnesus and the Aegean Islands. Greek vessels have gone to and fro between them in all ages, bringing the oil and wine of the southern climate in return for the grain and flax of the north. The cold and damp which could not ripen the grape and the olive rendered the southern products more necessary and greater luxuries; Lower Russia is still, as in the earliest centuries of Greek civilization, the great market for Greek wines. Even before the time of Herodotus, the passion of the inhabitants for the juice of the Greek grape was proverbial: to drink in the Scythian manner was to take the wine unmixed with water, contrary to the Hellenic custom, which has maintained itself until this day.

The valleys of the Danube and the Dnieper supply in turn the ports of the eastern Mediterranean with grain,—a commerce which has been firmly established since the time of the Persian wars. These streams were held by the Greeks as two of the three greatest and most beneficent rivers of the world. It was for good reason that so wise a statesman as Demosthenes regarded the security of commerce with these grain-producing lands as one of the most imperative demands of Greek policy. It is a concentration of this commerce which has so rapidly raised Odessa to its position as one of the chief European ports. The Pontic salted fish and meats were highly esteemed by Herodotus and Plato, by Aristophanes and Polybius. The ancient fisheries, especially those upon the southern shores of the sea, were of an importance fully corresponding to the great source of revenue now derived from the trade in tunnies and caviare. The advantages of this fishery were so great that the inhabitants of certain districts abandoned all other means of livelihood and devoted themselves entirely to fishing for tunnies, although the soil of their neighborhood was fertile and the adjacent

mountains rich in wood and in mineral products. The part of the fish nearest the tail was particularly esteemed. Athenaeus, who is very diffuse in the expression of his gastronomic delight upon this subject, relates that a jar of Pontic fish sold in his time for three hundred drachmas, which may be compared with the exorbitant price that the caviare procured at the mouth of the Danube still commands.

Beside its independent commercial importance, the Euxine was the highway for the convoys which brought the products of the far East to Europe in the most remote antiquity. This transit trade was so great that its influence, as before said, gave even to distant Ratisbon the character of an emporium. According to the accounts of ancient writers, the drugs, the silks, and the precious stones of India were brought by a seven days' caravan-journey to the Icarus, a confluent of the Oxus, in preference to the long and dangerous sea-voyage by way of the Red Sea. By this river they were floated to the Caspian Sea, across which they were carried to the mouth of the Kyros, and then up that river to a landing place, only four days' journey by land from the Black Sea. This was a difficult transit; but the desire of possessing the products of India overcame all obstacles.

So extended a commerce, direct and transitory, necessarily led to the early foundation of colonial towns. But the chill dampness of the Pontic winds, the severity of the northern winters, which rendered the open-air life of the palaestra and agora impossible, prevented these towns, however wealthy, from becoming more than populous mercantile stations. Nothing was more indispensable to the Greeks than warmth and a blaze of light. Where the laurel and myrtle, so dear from religious significance, could not support the extremes of the climate,—as on the shores of the Euxine, where all attempts to cultivate these plants failed,—the national characteristics of the Greeks could not be

developed. It very reasonably appeared terrible to those who had lived under the soft charms of Ionian skies, in the dry and warm Attic plain, or on the sunny islands of the Aegean, that the largest rivers, and even parts of the great salt Pontus itself, should be covered with ice. This was the more surprising to the ancients as it was commonly supposed that salt water could not freeze. When returning merchants brought assurances of the contrary in the rigorous climate of the northern Pontic districts, where the harbor of Odessa is yearly blocked with ice, the Greek geographers regarded it as a sign of the most excessive inclemency. They sought to explain the existence of ice by the great number of streams which discharge fresh water into the Black Sea, which, they argued, must float upon the salt because of its greater specific lightness. This sophism is adopted by Ovid in one of his epistles from the Pontus:—

Adde quod hic clauso miscentur flumina Ponto,
Vimque *fretum multo perdit* ab amne suam.
Innatat unda freto dulcis, leviorque marina est,
Quae proprium mixto de sale pondus habet.

Scythian snow was proverbial. The Pontic towns were often regarded as places of banishment, an antique Siberia, as it were. Scythia naturally seemed the very border of the habitable world. Its inhabitants were for the most part regarded with a fear and dislike handed down to late centuries. Even when the Genoese established their factories upon the banks of the sea, the land was possessed by the wildest hordes,—barbarians who caused Christendom to tremble as they advanced from the dreaded Pontus. In antiquity the Scythians overran Asia Minor; even Egypt was not beyond their wide-sweeping excursions, and Psammetichus, powerful as he was, was obliged to prevail on them to retire by means of gifts and entreaties. There was always a mixed population of such aborigines

and colonists in the settlements, like that described by Ovid at Tomi.

From the mouth of St. George a low, sandy ridge, intervening between Lake Raselm or Ramsin and the sea, stretches back almost directly to the west. The present Portitsco opening leads to the lake, to the site of the once flourishing and populous Istropolis. The entrance of ancient trading vessels of light draught to the Danube may generally have been here effected; there is connection between the lake and the arm of St. George. The dangerous shoals off the larger mouths would be avoided by this passage, and the distance from the Bosphorus to the shelter of the river considerably diminished. Though there may be no literary support for the supposition of such a course of commerce, it seems impossible otherwise to explain the existence of so large a town upon a lake which offered no advantages beyond that of a sheltered entrance to the river, and now, when nautical changes have rendered its shallow waters impracticable for trading vessels, is almost entirely deserted. The very name, Istropolis, seems to point to this conclusion. The first town upon the sea-coast south of the Danube is Kostenjeh, in the name of which may be traced the ancient Constantiniana, given it in honor of the sister of Constantine the Great. A few stones, showing traces of Roman workmanship, lie in its streets, but nothing remains of architectural importance. It is a mistake of the last edition of Dr. Smith's "Ancient Atlas" to mark Constantiniana as identical with Tomi, once the capital of the Roman province, and famous from having been the place of Ovid's banishment. The remains of Tomi are eight or ten kilometres from Kostenjeh, at a hamlet still called Tomisvar or Fegni Pangola. It was celebrated as the spot where Medea upon her flight dismembered her brother, whose limbs were collected and here buried by Aletes. The entire coast has the barren and uncultivated character which Ovid describes in lament-

ing his hard lot of exile,—the earth long covered with snow, the fields producing neither fruit nor pleasant herbs, no oaks upon the hills or willows upon the shores, the soil untilled and not desired as property by any man. The poet found as little good in the waters as on the land; and though he wrote his "Halieuticon" upon the fisher of the Pontus, he saw the waters ever deserted by the sun and lashed by perpetual storms. His only consolation during the miserable decade of his life spent upon its shores was found in literary work, and in acquiring the language of the inhabitants so perfectly as to be able to compose a poem in it to the honor of the ruler by whom he was sent from his native land. Ovid found his grave and funeral monument in Tomi.

As we proceeded southward, a storm detained our small vessel for days under Cape Caliacra, the ancient Tiristis, a cliff which rises abruptly from the water to a tableland sixty miles above the sea.

The town Tirissa, or Tetrisias, upon the plateau which extends from this point to the north and west, was called also *Aκρα*, from the precipitous ascent. Of this town no recognizable traces were to be found, the promontory now being covered by the weather-beaten ruins of a settlement, evidently of the early Byzantine epoch. Much of the fortress which formerly commanded the town still stands; its dark walls, rising high above the white Turkish lighthouse, forming a conspicuous landmark to the mariner who passes this almost inaccessible coast often in fear and trembling. A fortress stood here in antiquity as well as in Christian ages. Tiristis was used as a magazine by Lysimachus. The ancient Odessos, the present Varna, was one of the most wealthy and populous Greek settlements upon the Euxine. Extensive as the ancient town must have been, it has left absolutely no architectural remains. It would be interesting here to determine, through an examination of the earth by a few trial-pits, whether a canal for vessels

ever connected the almost unsheltered roadstead known as the port of Varna with the Lake of Deona,—a body of water of ample depth, separated from the sea by a narrow strip of land, over which it now discharges its surplus. Odessos, like almost all the towns upon this coast, was originally a colony of the Milesians. Miletus was the head of the commercial undertakings in this sea. After the foundation of the first Milesian colony on the Pontus, Sinope, the number of their stations increased rapidly, and there were few secure ports or even tolerable landing-places not taken possession of by that active people.

The Phoenicians, the first of ancient traders and seafarers, and the rough and practical Carians, who in great measure kept step with them, had opened communication with the barbarous tribes dwelling upon the shores of the Pontus. Both these nations had settlements upon the northern islands of the Aegean, and trading-posts upon the European and Asiatic coasts of the Euxine itself. The Carians were the more direct predecessors of the Greek colonists. Miletus stood upon Carian land, and at the time of Homer was under the sovereignty of that people. The sons of the Greek colonial city were strongly tinged with their blood. Herodotus relates that the settlers, not having brought Greek women with them, took as wives the daughters of the Carians whom they had killed in combat upon their arrival. Prominent Phoenician families dwelt also in Miletus until a late historical period, and the city had in the earliest times been a Cretan settlement. Phoenicians, Carians, and Cretans, the three great maritime nations of remote antiquity, were thus intermingled in the city: it is no wonder that Miletus, with its four harbors, should become the mistress of the ancient seas, and send colonists upon the track of the earliest explorers. The practical knowledge of this foreign people was early seized upon by the enterprising Greek population, who made

their city the home of the mercantile and geographical science of antiquity.

The number of the commercial stations of the Milesians multiplied until Miletus, itself a colony, was said to have founded eighty towns. It has been remarked that colonies are always most inclined to send out new settlements in their turn. Their citizens are not so firmly attached to the soil as those of the mother country, and the desire for travel and commercial undertaking is transmitted from father to son. The growth of the Milesian towns upon the Black Sea depended upon the advantages which their situation offered to maritime pursuits. Thus it seems natural that, few as are by nature the accessible points of the shore, the present coast-settlements should be almost always in the exact position chosen by the ancients. Sites thus built and rebuilt by different races can retain no trace of ancient structures,—unsubstantial as these, from their destination, are likely to have been. The Ionic commercial towns of the Black Sea, however wealthy and frequented, could have had but little similarity to the Doric colonies, with their imposing monumental constructions, which lined the coasts of Sicily and Magna Graecia. While Metapontum, Poseidonia, Acragas, and Selinus still show remains of temples which may be compared to the ruins of the Athenian Acropolis, Varna is entirely a modern town, with no reminiscence of its importance in antiquity. Mesembria, farther to the south, was founded by Greek auxiliaries at the time of the return of Darius from his expedition against the Scythians; a small village upon the site still preserves the original name. Sizopoli is a better representative of Apollonia, a colony of the Milesians, founded half a century before Darius. Its name was derived from a temple and a colossal statue of Apollo, a celebrated work of Calamis, carried to Rome by Lucullus. Apollonia, known also in antiquity as Σωζόπολις, was so flourishing at one period that it was able to found a colony

of its own upon the opposite peninsula of Anchiale, where a few coins have recently been found. Midia, still retaining in its name some trace of the ancient Salmydessus, is the principal town upon the long and exceedingly dangerous coast which, for nearly one hundred and fifty kilometres, stretches in precipitous cliffs to the Bosphorus. The name Salmydessus was first applied to the whole extent of the land from the promontory Thynias, the present Iniada, to the Cyanean Rocks, but by later writers restricted to the chief city. Its inhabitants were especially notorious as cruel wreckers, which may have done much to attach to the sea which beats upon their inhospitable shore its original name *Πόντος ἄξενος*; theirs were the cliffs, dreaded of old by Greek sailors,—

τραχύα πόντου Σαλμυδησσία γνάθος
ἐχθρόξενος ναύταισι, μητριὰ νεῶν.

The traces of fires kindled to mislead mariners who were eagerly seeking the opening of the Bosphorus still blacken prominent points of the shore. The entrance to the narrow strait from the Black Sea is blind in thick weather; even now, when every assistance possible is rendered by lights, beacons, and whitewashed cliffs, it is bewildering and dangerous to sailing vessels. Deceived by false signals, driven upon the rocky shore by the prevalent northern winds and currents, many ancient ships were yearly wrecked upon this coast, their cargoes plundered, and the surviving mariners doomed to slavery or death. Midia, situated among the rocks and shoals of Cape Serveh, is of particularly dangerous approach.

It is not strange that Greek mariners, though they ventured boldly, have in all ages had a great dread of this sea. The ancient saying, "He has come from the midst of the Pontus," was expressively applied to one who, almost beyond hope, had escaped from fearful danger. Its immense expanse, without sheltering projec-

tions of the land and without islands, its rugged and steep or sandy and swampy coasts, which extend for great distances without refuge, made it a strange and fearful sheet of water for boatmen accustomed to the nooks and favorable anchoring places abounding in every part of the Aegean. The waters of the Black Sea are rough even in quiet seasons, being disturbed by the irregular and conflicting winds which descend from the high Caucasian Mountains, and from the ranges of Haemus and Olympus, or which rush from the broad valley of the Lower Danube and, above all, from the barren and bleak Russian steppes to the more rarefied atmosphere of southern latitudes. Its shores are often veiled in dense fogs. The currents and counter-currents of the many rivers which tend to the great outlet of the Bosphorus, being more or less influenced by every wind, are exceedingly variable. All these dangers and difficulties are especially felt by small craft, incapable of standing out to sea, such as were the vessels of the ancient Greeks, whose maritime qualities were developed upon the Aegean and influenced by its peculiarly favorable character. Boatmen of Tenedos and Samos incredulously smiled at our mention of the *Μαύρη Θάλασσα*, and held it improbable that so small a craft as the "Dorian" could have accomplished the voyage from the Danube to the Bosphorus even in the best of seasons. And, indeed, after experiencing evils which were nearly as tragical as those to which Arrian and his companions were exposed upon this wicked sea, we could fully appreciate the joy of all ancient sailors in reaching the shelter of the strait, throwing the anchor behind the Cynæan Rocks, in a spot which must have protected many light-draft Phoenician and Greek coasters from the distressing roll without. With such delight must Orestes and Iphigenia with the statue of Artemis, and Jason and Medea with the Golden Fleece, have welcomed their escape from the stormy waste.

The Cyanean Rocks, the Symplegades of the Argonauts, never could have been a nautical danger. It is, however, not strange that the traditions of timid seafarers of primitive times should have attached themselves to these prominent and isolated masses just at the portal of the Euxine. The sea, which is deep close to the rocks, beats upon them in northern storms with incredible fury; and the dark blue-gray stones do indeed seem to move, and even to rise and fall, as the flood dashes upon them and retires, exposing them far below the water-line. The thick fogs and the crashing noise of the waves, which the ancient poets associated with the Symplegades, are still characteristic of them. The Greeks were accustomed to ascend to their summits and offer sacrifice, propitiating Poseidon before venturing upon the wild and dark expanse of the Euxine stretching beyond. Darius chose this point for his first view of the sea, which from here is truly, as Herodotus says, well worth seeing. There are few signs of work upon the rocks themselves; the summits are not at all levelled or terraced, and the ascent, by means of the natural clefts and seams of the volcanic conglomerate, requires a sure foot. Conspicuous upon the highest peak, perhaps eighteen or twenty metres above the water, is an altar of marble, 1.38 metres high, and .83 of a metre in diameter. The surface of this monument is ghostly white, like the columns of Sunium, which are in a position similarly exposed to the rude breath of salt winds. The block is known as the Column of Pompey, though it is no column, and in all probability is not of the time of Pompey. It seems likely, however, from the reports of the earliest travellers, that a shaft once stood here, a humble namesake of the great Alexandrian column, possibly rolled into the sea since the time of Tournefort. The altar-block which has inherited its name could not originally have stood in its present situation, balanced upon the rough surface of the summit. Traces of iron clamps and dowels of a former base are visible upon the marble. It

must be supposed either that the lower part has disappeared from the rocks, without leaving a trace of its position; or, as appears more probable, that this circular drum was brought as an incomplete fragment from some former site. Dionysius of Byzantium relates that the Romans erected an altar to Apollo upon the Cyanean Rocks: this



THE ALTAR UPON CYANEAN ROCKS.

block may be the remains of the altar, and the laurel garlands which encircle it lend weight to this supposition. Its erection in the present situation, if it is to be ascribed to antiquity at all, must have been at a late time, and could not have been preceded by extensive structures of any kind. The projecting ornaments of the altar, the bucraniae and garlands, are much defaced. The inscription can no longer be deciphered: in its place are scratched the names of sailors whom curiosity has prompted to climb this landmark at the mouth of the Bosphorus.

It was upon the cape at this end of the strait that Jason

consecrated to the Gods the anchor of the Argo, taken from Cyzicus, which had served so well in the dangers of the Black Sea. The anchor has always been the symbol of Pontic cities. The spot marked by Jason as a sanctuary had the good fortune to find favor in the eyes of Byzantine Christians, and its religious significance is still perpetuated by Islamism. Farther to the south, upon the European shore, stands the cliff of King Phineus,—the city of vultures, *Γυπόπολις*,—where the Argonauts, Zetes and Calais, destroyed the Harpies sent as avengers of the mutilation of their sister Cleopatra. The spot is a fitting dwelling for the prophetic son of Phoenician Agenor, who is to a certain degree, doubtless, symbolical of the Phoenician pilots who preceded and led the Greeks to the sea which broadens beyond this portal of the strait.

It is difficult to conceive of a greater natural change than that from the rugged and frightful shores of the Black Sea to the wonderful garden of the Bosphorus, the delight of all ages and races. The waters of the stream wind like a salt river between the hills of Thrace and Bithynia. It was with reason that the ancients regarded the Euxine as the mother of waters, receiving as it does the watershed of more than two thirds of Europe and of a large tract of Asia, and overflowing with a powerful current, which is felt through the Bosphorus, Propontis, and Hellespont to the headlands of Samos and Sunium, and still further south. At every point on the shores of the Bosphorus we are reminded of the legends and life of antiquity.

The strait is contracted between the castles of Anatoli and Roumili Hissar to a width of only 550 metres; its depth is over 100 metres, twice that of the maximum sounding in the English Channel between Dover and Calais. The current is here exceedingly strong, as is

COIN OF THE
BLACK SEA.

natural from the great body of water which rushes from the high level of the Black Sea. At this point Mandrocles, one of those great Samian architects and engineers who constructed so many of the wonders of the ancient world, built the bridge over which Darius and his army passed in the expedition through Thrace to Scythia. An anchorage in such deep waters was impossible, even a few metres from the shore. It must be assumed that the boats which formed the bridge were kept in position only by being bound to each other by cordage and perhaps by chains. With the rapidity of the water, which often flows eight or nine kilometres an hour, the strain upon boats thus attached must have been enormous. The stream a little below this point, where the width of the Bosphorus is still very considerable, is known to mariners as the Devil's Current.

The combined advantages of a river-harbor and a seaport gave importance to Byzantium in the earliest ages of Greek settlement. At the Seraglio Point, which here severs the current of the Bosphorus and directs one part of its waters into the Golden Horn, landed the "fording cow" which gave the name to the strait,—Io, restlessly attempting to escape from the gad-fly sent by Hera. Upon the same spot landed the leaders of the Megarian emigrants who first stepped upon the land which was to become the greatest of Greek colonies and finally, in Christian centuries, the death-bed of Greek learning. The fragments of antiquity remaining at Constantinople are few and meagre. They have most of them been often described.

An attempt to discover any fragment of architectural remains bearing the easily recognizable forms of the Greek Doric style was absolutely without success.

Opposite the mighty city, the commercial and political capital of southeastern Europe and much of Asia, stands the small and insignificant Kadi Koi,—the original Greek

colony of Chalcedon, famed for its temple and oracle of Apollo, second only to those of Delphi. The inhabitants were termed "blind" by the Delphic oracle, famed as the founder of colonies, for overlooking the signal advantages of the opposite shore and the Golden Horn, with a lack of geographical insight contrasting strongly with the wisdom of Delphi. Far beyond Kadi Koi rises the snow-covered peak of the Bithynian Olympus. Sailing rapidly through the Propontis, vestibule between the Mediterranean and the Black Sea, we made only a short stoppage off Seliori, the ancient Selymbria whence traces of the enormous wall, seventy or eighty kilometres long, may be followed across the country to the little promontory of Kalionjik, that second ancient Scylla upon the horrible coast of Salmydessus. This wall, built by the Emperor Anastasius to protect the entire peninsula eastward to the Bosphorus and Byzantium, remains as a monument to the utter military inefficiency of the Byzantine Empire at the commencement of the sixth Christian century. A natural parallel to the strait of the Bosphorus with its castles of Roumili and Anatoli Hissar is the narrowest part of the Hellespont with those of Abydos and Sestos. As Darius passed the Bosphorus over pontoons at the former point, so did Xerxes carry the might of the Persian nation across the Hellespont at the latter. His bridge of boats was doubtless constructed much like that built by Mandrocles. The description of it given by Herodotus is not very clear. An anchorage, entirely impossible in the Bosphorus, could perhaps be secured, as he says, in some part of the Hellespont. The five times greater width of the latter strait would otherwise have rendered the bridge impossible; for the cordage of white flax and papyrus, which bound the separate vessels together, would have been insufficient to withstand the leverage of a current which is always strong, and which, with returning



COIN OF BYZANTIUM.

notherly winds after a southern gale, equals that of the Bosphorus.

To build a pontoon bridge across the Hellespont would even now be hazardous : it is not surprising that the elements would not permit either of the structures of Xerxes long to stand. The Hellespont hardly deserved the extreme displeasure of the king because of the failure of the first attempt, and might have been spared the insulting speech, the three hundred lashes, the sunken fetters, and the branding, which are reported to have been inflicted upon its waters. The royal decapitation of the first contractors because of their ill success was far more serious than such a harmless display of irritability. The castles of Europe and Asia upon the Hellespont, like those upon the Bosphorus, were founded by the energetic Mahomet the Conqueror. The castle of Asia is upon a low, projecting tongue of land, Nagara Burun, at a partial turn of the strait. It is from this point that Leander must have nightly crossed to visit the beautiful priestess of Aphrodite, the current here offering some slight advantages to the swimmer. The remains, crumbling to a formless mass, which are pointed out near Sestos as the tower of Hero, belong to an entirely different age from that assigned to the story of the two lovers. The width of the Hellespont is given by Pliny as seven stadia, or 1167 metres ; but this is far too narrow. It scales upon the English admiralty charts as about three kilometres. The difficulties of Leander's passage are not, however, to be measured by the absolute distance between the two shores. The stream is swift and the waters are chill at all times of the year. The low average temperature of the Black Sea is but slightly raised in the Sea of Marmora ; this surface warmth hardly affects the strait of the Dardanelles, where the current mixes the waters of all depths together. All who have bathed in the Bay of Phalerum, or upon any eastern Mediterranean shore, know how cold these

waters are in midsummer after being disturbed by a storm. The passage has been accomplished a number of times since the story of the loving youth of Abydos made it a celebrated feat; among others, by the writer, in a few minutes less than an hour.

The hills of Abydos are beautiful, fertile, and rich in color, contrasting strongly with the poor and barren European coast,—a clayey soil, lightly covered with sand. It is yet worthy of remark that most of those who have become celebrated by crossing this arm of the sea went from the richer to the poorer shore. This was the direction of Leander, of Xerxes, and in later times of Soliman and the host of Mahometan conquerors. The army of Alexander under Parmenio crossed, however, from Europe. So went also the fair and delicate Helle, who fell from the ram, which was carrying her from the dreaded sacrifice, into the waters called by her name. The Christian appellation, the Arm of St. George, is now well-nigh forgotten.

Sestos and Abydos, always strong and fortified places, were often in arms against each other; their contentions continually ravaged the fertile country along the course of the strait. Sestos was an especially important fortress, offering a stubborn resistance to the first Athenian fleet that appeared in the Hellespont, and serving as a magazine for the Persians, who here stored the tackling of their great pontoon bridge. The broadening stream sweeps into the Mediterranean, past the Trojan plain marked by the sand-castle Koum Kaleh, and by the tumuli which bear the name of Homeric heroes.

The situation of these tumuli is certainly well chosen for an imposing effect. Placed upon the extremity of the cape, they may be seen by approaching vessels from afar, even from shadowy Lemnos, where Philoctetes lay in agony at the time of their erection.

A light breeze in the cool gray of the first June morning carried the "Dorian" from the low beach of Koum



PHRIXUS AND HELLE. FROM A VASE.

Kaleh towards Imbros. But though the distance may easily be traversed in three hours with a fair wind, the boat was soon becalmed, and floated listlessly while the full force of the Dardanelles current swept it so far out to sea that we hardly reached the western extremity of Imbros at night-fall. Imbros, with its rocky and sterile hills rolling in a long range from end to end of the island, is said to be destitute of any traces of antique architecture. It had not an interesting or eventful history, following always the fate of its neighbors, and seldom taking any decisive part in the events which affected them. After the boat had proceeded a short distance from the island, the wind for a second time died out entirely. An absolute calm continued for two days and nights under the cloudless summer sky,—a phenomenon said not to be infrequent just before the advent of the Etesian winds. The gentle waves gradually subsided,

until the surface of the sea became as a mirror. With the vertical sun lighting up the transparent waters, it is possible to see to a great depth, and watch the large fish and tortoises moving listlessly below. The heat of the motionless atmosphere gradually became intense. On the second day the air was like the breath of a furnace ; the sun was pitiless, and our eyes were burned by the reflection of its beams ; the shores of Imbros and Samothrace veiled their colors in hazy iridescence, and the pallor of extreme light and heat enveloped heaven and sea. It is soon seen why the Mediterranean is called by modern Greeks the "*Ασπρη Θάλασσα*" in opposition to the Black Sea : the pale light and white water of those calm days brought the contrast very strongly to mind.

The peak of Samothrace towers high to the sky, rising abruptly to an altitude given by the English admiralty charts as 1600 metres,—thirty feet less than an English mile. Steep cliffs turn the back of the island, as it were, to Imbros and to those who approach from the south. The shore is here inaccessible save at one or two points ; the mighty rocks above, furrowed by deep rents, are inhabited only by a species of wild goat, the skins of which are greatly prized by the islanders. This entire southern region is seldom visited, attracting only the most adventuresome hunter. Closed by this imposing wall from all the Archipelago save Thasos, the isolated island was a fit seat for such mysteries as those which once rendered it celebrated. Samothrace is the highest island of the Eastern Mediterranean ; its peak and that of holy Mount Athos rise like two grand natural altars, throning over the Thracian Sea, as though destined by nature for the religious significance which has been accorded to them in different ages. The island is visible for a great distance, appearing above the hilly ridge of Imbros, a conspicuous landmark to all who pass along the great highway of commerce from the west to the east ; but its shores offer no casual stopping-places, and it is gen-

erally viewed only thus from afar. It is without peculiar attractions, and its situation now makes it almost neglected; in antiquity it was visited mainly by those who sought the advantages of refuge and expiation accorded at its shrines, or were desirous of initiation into the rites of the Cabiri. Its situation, aside from the traffic which the formation of land and sea has led into such fixed courses in this part of the Mediterranean, its difficulty of access, the very danger of approach to its steep and unsheltered shores,—all so entirely separate it from the every-day intercourse of man that it is as completely out of the world as it is possible for any land to be which is so near populous continents and islands. This is readily understood by a comparison of Samothrace with the frequented little port of Tenedos, where the harbor is constantly crowded with crafts of all kinds, while the wharfs are busy with the bustle and hurry of trade, and the *cafés* frequented by the sailors of a hundred different ports. Samothrace at the level of the sea is little more than the base of the immense mountain-peak which rises abruptly from the waters. He who climbs the steep sides must enjoy an unequalled view from the bold summit. It was upon its topmost crag that Poseidon sat, surveying the heights of Ida, Troy, and the fleets before its coast.

Οὐδὲ ἀλασκοπίην εἰχε κρέων ἐνοσίχθων·
καὶ γὰρ ὁ θαυμάζων ἡστὸ πτόλεμόν τε μάχην τε
ἥψον ἐπ' ἀκροτάτης κορυφῆς Σάμου ὑλησσῆς
Θρηκίης· ἐνθεν γὰρ ἐφαίνετο πᾶσα μὲν Ἱδη,
φαίνετο δὲ Πριάμου πόλις καὶ νῆσος Ἀχαιῶν.
ἐνθ' ἀρ' ὅγ' ἐξ ἀλὸς ἔξερ' ἵων, ἐλέαιρε δὲ Ἀχαιοὺς
Τρωσὸν δαμναμένους, Διὶ δὲ κρατερῶς ἐνεμέσσα.

Αὐτίκα δὲ ὅρεος κατεβήσετο παιπαλόεντος
κραυπνὰ ποσὶ προβιβάσ· τρέμε δὲ οὔρεα μακρὰ καὶ ὑλη
ποσσὸν ὥπ' ἀθανάτουσι Ποσειδάνων οἴντος.

The name "Thracian Samos" reminds one of the more southern island. The two highest mountain caps of the

Aegean have so much similarity that it is easy to believe with Strabo that the name once designated such an elevation as the towering peak of either Samos, and that the adjective "Thracian" was given by the Greeks solely for distinction, although it had become incorporated into one word as early as the time of Herodotus. The stream of the Hellespont is almost entirely broken, north of its outflow, by the island Imbros, which lies like a bar across its upward course. The current moves only very slowly to the northwest upon the southern side of Samothrace. On the western extremity of the island it is more perceptible, and, uniting with a westerly movement of the waters upon the northern coast, has formed a spit of sand and gravel, which there projects, a strip of flat land of some little extent, enclosing two small salt lakes. Around this point, upon the northern coast, is the usual landing place of the island, the so-called Kamariotissa,—a settlement consisting of two or three low huts and a chapel. Here lie the few boats which keep up the necessary communication between Samothrace and the mainland, dragged up on the beach by means of a pulley and rollers. Few vessels touch here in pursuit of traffic; the entire lack of shelter almost prevents the approach of ships, and renders the stranding of the smaller craft inevitable, even in the most favorable seasons. Some fishing-vessels, however, were afloat, and the fixed ballast and iron keel of the "Dorian" preventing its being dragged ashore, our boat was anchored in their company. On two occasions, fearing the advent of the dreaded Etesian winds, the entire little fleet got under way in the middle of the night, flying around the point to the southern lee of the island.

It is naturally the continual lament of the inhabitants of Samothrace that they have not a government sufficiently energetic to provide shipping with some slight shelter, though it were only a short straight mole at Kamariotissa. The connection of the neighboring salt lakes

with the sea by a channel naturally suggests itself. An entrance of only one metre in depth would be sufficient for the most pressing need, and this would not be difficult to effect. It is possible that some such connection existed in antiquity, although Pliny characterized Samothrace as *insula importuosissima omnium*. It can never be possible effectually to shelter large vessels upon its shores.

The conformation of the island strongly reminds one of a flooded mountain-peak, and of the Greek legend, told by Diodorus, which imagined the Black Sea, formerly entirely enclosed as an island lake, swollen by the influx of the waters of the Danube, the Dnieper, and the Don, until it overflowed the land which intervened between it and the Mediterranean. It thus formed the Bosphorus, the Propontis, and the Hellespont, and, bursting into the Thracian Sea, inundated the islands, which lost much coast-land by the rising waters. Hence it came that fishermen, casting their nets near the shore in after ages, drew up capitals and other fragments of the buildings which had stood on the inundated plains. Upon the pebbly coast, washed high by the waves of Etesian storms, lie here and there heaps of charcoal,—the only article of importance exported from Samothrace,—awaiting the boats which carry it to the main-land and to islands more destitute of wood. The only village is far inland, placed in security upon two sides of a steep and narrow valley, probably because of pirates who, from the time of the Mithridatic wars—when they pillaged the island and escaped with a booty valued at a thousand talents—until the last struggle for Greek independence, seldom have allowed the island long repose.

The situation of almost all island towns of the Aegean has been chosen with reference to ready protection against marauding bands. They generally stand upon some steep elevation. The massive walls of their churches and monasteries permit them to serve as strongholds in

the emergency of an attack. The houses of the present village of Samothrace, which has no other appellation than "Chora," are of the most common stone of the island, a tertiary trachyte, of rich, warm color, though a miserably coarse building material. The walls are seldom plastered within, never without. The ceiling beams are simply worked with the axe from rough branches, agreeably to the law of Lycurgus; upon these lies a thick layer of earth, pressed down after every rain-storm by rollers of stone, which are often of marble from the ruins of the ancient town below. These roofs of earth have lately found favor in northern climates, especially in Sweden and Norway. They were apparently not in use in ancient times in Greece itself, but were very common in Asia Minor, where they still are prevalent in certain districts. They are mentioned by Strabo as found in Persia. The common houses of Mesopotamian cities were generally thus roofed. It is curious that the cylinders of stone which lay upon them as rollers have often been falsely supposed fragments of columnar supports, which have been introduced into restorations upon this misunderstanding. The houses of the village of Samothrace seldom consist of more than the four enclosure walls, sometimes without even windows, the light entering through the ever open door. So steep is the side of the hill upon which they stand, that the floor of one is generally upon the level of the roof next below it. In winter, nearly all the inhabitants are collected here; in summer, many are scattered over the island in isolated huts, tending herds of goats and preparing their white, chalk-like cheese.

The male population was stated by one of the best informed villagers as between fifteen hundred and two thousand souls, — a rough estimate, which seemed exaggerated. The present inhabitants, excepting the lowest class of shepherds, are said to have largely immigrated to the island from Albania after the devastations of the last war of independence,

which nearly depopulated Samothrace. The conquest of the island by the Turks in 1457 was still more frightful. The richest of the inhabitants were removed to Constantinople, the youngest and healthiest sold as slaves in neighboring ports. Only the meanest were then left to till the soil for the Turkish guard. Not a person was permitted to remain whose ability or beauty would have a marketable value in Turkish bazaars; only very few were sly enough to escape the officials by long concealment in the almost inaccessible ravines of the mountains above. It is not surprising that modern races of Greeks, who have been repeatedly subjected to such treatment and to a constant oppression by their half-civilized conquerors, have finally become so degenerate as to be too frequently a sad caricature of their ancestors.

The ancient town of Samothrace was upon the coast, its foundation evidently having taken place at a time of greatest security from sudden assaults. As one climbs up the dry, brown cliffs and down the fertile beds of water-courses, the white marble ruins peer from among the vegetation, particularly dense for Greek soil, which covers the site. To the scrub-oaks which grow upon every part of the island there are here added maple and plane trees, thickly interlaced with many varieties of twining vines. The advance upon untrodden paths is almost impossible. The town lay upon a well-watered slope, a spur of the mountain-peak now called Agios Georgios. Its extent of about twenty hectares is enclosed by gigantic walls to the west and south, and bounded on the east by a high hilly ridge. The enclosing wall is one of the most remarkable specimens of rough Greek masonry known. More than a kilometre long, it is constructed of immense polygonal blocks of the stone which forms the mountain-ridge, laid together without mortar and without smaller wedge-blocks in the interstices. In many places it is so entirely overgrown with trees and shrubs that its course can hardly be followed. The masonry is very

coarse and irregular, and the wall itself is of such varying size that it is impossible to decide its original dimensions in any place. It could not have been much less than six metres high ; the stones are in several places in position to nearly that height. The thickness of its course varies from two to four metres. The plan is very irregular, care having been taken to prevent its running too far in a straight line ; and it is broken by angles which allowed the defenders behind its ramparts to attack the side as well as the front of an advancing enemy. The breaks, as is usual in such cases, exposed the right flank of the attack, which was not protected by the shield. The only gate which still remains complete is spanned by horizontal projecting courses of regular height. The covering of at least one of the two other openings which can be distinguished seems to have been of similar structure.

There is now no manner of ascertaining at what period of the island's history this gigantic wall was built. It may possibly have been even before the introduction of the mysteries. This is the decided opinion of Conze. Such a massive wall of rough materials might have stood as a memorial of gray antiquity in the midst of a town which had received a new impulse of life, in the same manner as so many town walls, constructed during the Middle Ages, still encircle or are built into flourishing European cities. The more pretentious later buildings of Samothrace outside of these walls may well be compared to the boulevards and rings of modern capitals, with their immense architectural works, which would survive the utter obliteration of the crowded streets of private dwellings lying within the fortifications of former centuries. Samothrace had a venerable legendary history preceding its importance as the shrine of the Cabirian mysteries. But, on the other hand, it is almost inconceivable that such gigantic structures as these walls could have been built at this period on an island which, if bereft of the

religious rites, could have had no more importance in antiquity than it has to-day ; which, from its position and inaccessibility, could never have had the commercial importance that in different ages has created populous cities on the barren islands of Delos and Syra ; which, from want of extended tracts of arable land, could never have supported a much greater agricultural population than that now existing upon it. It is not known at what date the Cabirian mysteries peculiar to Samothrace were instituted or introduced : a remote antiquity is not to be assumed from any of the inscriptions yet known which relate to them and to the initiations. Of the rites themselves it is safe to say that absolutely nothing is definitely known.

The sea-beach before the town is now straight and without shelter. It must have cost much labor to excavate the small port of the town, and to build the protecting mole which existed in antiquity. A few rocks of the latter are visible upon the sand beneath the water. The port, a circular basin of perhaps one hundred metres in diameter, is now overgrown with rushes and swamp-plants, which mark its extent. It is entirely closed by the high bank of pebbles thrown up by the waves.

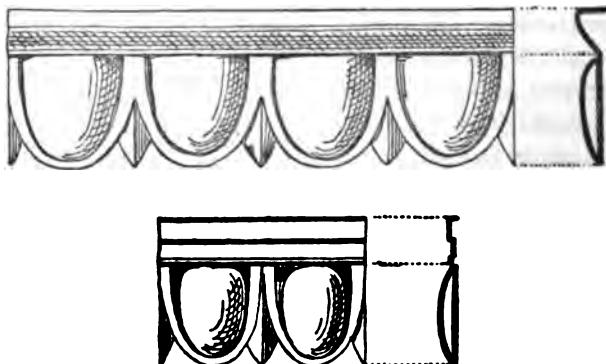
Considering the dependence of the island upon boats for its only communication with the rest of the world,—a communication rendered particularly necessary for the comparatively dense population by poor soil and insufficient productivity,—it is not surprising that the inhabitants of Samothrace obtained a reputation for admirable seamanship. It was a vessel of this island which at the battle of Salamis redeemed the character of the Ionian allies of Xerxes for bravery, and confuted the calumnies of the Phoenician captains. Herodotus relates how the Persian monarch, from his high seat upon Mount Aegaleos, saw a Samothracian vessel run down and sink an Athenian ship. Being attacked in turn by a vessel of

Aegina, the Samothracians saved themselves from sinking by jumping upon this latter craft, where they carried on the combat with the crew until they had obtained the mastery of it. The exploit cost the Phoenician slanderers their heads.

The larger buildings of the later town were outside the walls, chiefly in a glen, which ascends the mountain and receives the waters of a small brook. The stream flows sparingly in June, but is evidently swollen to a rushing torrent in the rainy season ; its inundations have covered a great part of the ruins with earth and have even rolled down large boulders from the mountain-side. The situation is beautiful, on the northern side of high mountains, which protect the verdure from the fierce blaze of a southern sun. It is only three or four hundred paces from the pebbly beach of a most beautiful sea ; it is cooled by the northern winds, and well watered during the long, dry summer. The ruins show the larger buildings to have been so closely crowded together that modern conceptions of architectural composition would have been offended by their proximity. This was common in ancient times, however, and was especially natural in Samothrace, upon which mountainous island no road or passage broader than a bridle-path could ever be of use. The interposing of broad streets and bare rectangular places between monuments is more in accordance with imperial Roman and particularly with modern ideas of grand display, — giving a cold and formal character, decidedly opposed to the more artistic and genial grouping of architectural masses peculiar to the Greek and Gothic styles. The two principal marble buildings of Samothrace, which can be understood from the overthrown remains, were of the time of the Diadochi, in architectural treatment being midway between Greek and Roman forms, as the civilization of that period was a similar intermediate stage. They were built of a stone which must have been brought

by vessels, as the island itself produces no such material. It is of coarse grain and exceedingly friable, resembling the marbles of Marmora and Thasos, from which latter quarries it was probably derived. The more important edifice was a temple, probably used in connection with the rites of the mysteries. It presents but few peculiarities beyond a deep prostyle, developed somewhat at the expense of a bare and exposed cella. The door alone adds interesting details to our knowledge of Greek temple portals.

It is not my present purpose to give a description of any of the buildings represented by the confused ruins of this town of Samothrace. Such an account, to have even a critical value, would lead too far, and would largely be a repetition of the official publication of the Austrian excavations. It is perhaps sufficient to mention some fragments of bronze, found during these investigations



BRONZE FRAGMENTS FOUND AT SAMOTHRACE.

among the ruins of the marble temple, to which special attention has not been called, although they appear of peculiar architectural interest.

They are beaten to the characteristic form of the so-called egg-and-dart moulding, and possibly served as part of the decoration of the door. May it not be conjectured

that the origin of this peculiar ornament is to be traced to the embossed metal work which is known to have played so great a part in the earliest architecture of Greece, and especially of Asia Minor, whence so many ornamental forms were taken by the masters who developed the Greek styles? The marked convexity of the egg-and-dart moulding, as well as of the bead astragal, seems to point to the principle of metallic reflection as influencing their origin. The form of the embossed metal ornament was retained in the working of the stone when the metal was disused. This superposition gains weight from the frequency of gilding upon these convex members in the fully developed stages of the Doric and Ionic styles: in this manner the original reflection was again attained.¹ The architectural treatment of stone has been always more or less affected by the material which preceded it chronologically in construction. It offers few peculiarities of texture from which characteristic stone forms result. This want of idiosyncrasy in stone permitted the development of conventionalized members the forms of which were originally determined by the peculiar fibre of wood, such as the coffers of the pteroma or the Doric entablature, or by the malleability of metals, such as the minor decorative mouldings.

The second marble building, standing close to the temple, owed its existence to the safety which the island offered as a refuge. It is attested by an inscription to have been the offering of Arsinoë. That Egyptian queen, the daughter of Ptolemy I. and Berenice, was first married to King Lysimachus, supplanting his former wife, Amasis, and becoming the mother of three children. These

¹ A division of polished metal work into partially globular bodies, each of which catches and throws back the light, is a well-known resource of the designer. It is only necessary to refer, for a striking illustration of the principle, to the bulbous mediæval chalices and monstrances, such for instance as the cups of the recently discovered Ratisbon treasure.

were adopted, because of their claims to succession, by her savage step-brother, Ptolemy Keraunos, who by most sacred oaths persuaded Arsinoë to become his wife,—only to murder the two younger boys in her arms. It was then that she sought refuge upon the sacred island of Samothrace, where she remained until married to her own brother, Ptolemy Philadelphus, who raised her to the throne of Egypt. The former wife of that ruler, also named Arsinoë, enraged at the intimacy of her husband with one already so near by blood-relationship, entered into a conspiracy against him, the discovery of which caused her banishment. The daughter of Berenice seems to have borne in mind the protection which Samothrace had afforded her in time of need, and erected the circular building, of which the ruins lie scattered here among the bushes, literally not one stone being left upon another. The remoteness and inaccessibility of the island, which had given to it its mystical character and made it the home of the Cabirian rites, also rendered it attractive as an asylum. It is interesting that the two principal buildings of Samothrace represent the two opportunities afforded by its physical character: the marble temple was sacred to the mysteries, the circular edifice was the offering of one who had sought refuge upon its shores.

Arsinoë was not the only ruler who fled to Samothrace after the reverses of fortune. Ptolemy Physcon sought protection here when Egypt was taken by Antiochus Epiphanus; and King Perseus, defeated at Pydna and despoiled of his kingdom, came to enact a new deed of horror upon its shores. He cruelly murdered his follower Evander, who had accompanied him to the island, when he saw that the Samothracians resented a profanation of their sacred asylum by one who but a short time before had attempted to take the life of Eumenes upon the very threshold of the temple of Delphi. Here the unmanly king, who had boastingly proclaimed his glory

as equal to that of the Great Alexander, surrendered, with childish tears and laments, to a Roman admiral, and was carried to Italy to grace a triumphal procession through the streets of Rome.

The chief town of Samothrace, the scene of the Cabirian mysteries, is now deserted, being resorted to by the present

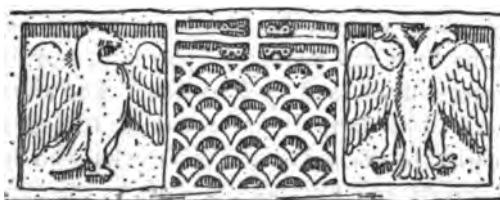


inhabitants only as a quarry and a lime-kiln. As marble occurs elsewhere upon the island only in a small unopened ledge, the ruins were obliged to supply all the lime which was so freely used by the builders of the three mediæval castles upon Samothrace,— one in the present inland village; one upon the promontory, at the site of the

ancient town ; and one farther east, upon the northern coast.

With the advent of Christianity and the extinction of the mysteries, Samothrace fell into that state of desolation which became the lot of so many of the Aegean islands after the Mithridatic wars. When, in the fourteenth century, the merchant princes of Genoa and Venice contended for the commerce of the East, the islands of the Thracian Sea again rose to considerable importance. They to a certain degree commanded the Hellespont, the entrance to Byzantium and the Euxine, which was still, as in Greek antiquity, one of the most frequented passages to India. After more than a thousand years of neglect, Samothrace flourished again under the Gattilusii, the princes of Lesbos, whose story is a worthy epilogue to the ancient history of the island. The Genoese had by the middle of the fourteenth century obtained the greater part of the commerce of the Black Sea, although the throne of the Byzantine Empire was held by Cantacuzenos with his Venetian alliance. Venice and Genoa often fought their battles in the capital of the East. Francesco Gattilusio, a merchant-noble of Genoa, came to Tenedos to trade, with several ships that were in effect men-of-war, so heavily were the merchant-vessels of the day armed against the pirates who infested the Archipelago. The attempt of John V. Paleologos to dethrone Cantacuzenos was favored by the Genoese state, and Gattilusio was easily enlisted to direct service by the promise of the Pretender's sister in marriage, with the Princedom of Lesbos as her dowry. The Princedom of Lesbos included the sovereignty of Lesbos, Tenedos, Ainos, and the four Thracian islands,—Lemnos, Imbros, Samothrace, and Thasos,—and apparently some points of the coast of the Troad. Gattilusio succeeded in surprising Byzantium one stormy winter's night of 1354, and, afterwards, in clearing the northern Aegean of the pirates who had rendered traffic insecure. His

family ruled the assigned princedom for more than a century. It was during this period that the three castles of Samothrace were erected : that of the present village bears the Gattilusio coat of arms upon one of its stones, — the eagle of the Byzantine emperors, the cross with the four B's in the interior corners being peculiar to the Paleologos family.



COAT OF ARMS OF THE GATTILUSII. SAMOTHRACE.

The most interesting of the three castles is that on the east, upon the northern coast, at the mouth of one of the water-courses. The remaining tower has given the name Pyrgos to the spot. Its walls are of exceeding strength, so that the narrow, brick-vaulted staircase which leads from the first to the second story is built within their thickness, and yet leaves enough at each side for support and security. The situation and arrangement of the ruin are exceedingly picturesque. Pyrgos is one of the most attractive spots of all Greek shores. A cool brook runs from the foot of the cliffs, whence it has fallen as a silvery cascade, past green and wooded banks to the sea, which it enters by the side of this crumbling monument of a proud and adventurous race, now almost more forgotten than the ancient Greeks who preceded it in possession of the island. Shepherds who were here guarding a herd of goats told us a legend, also related to Conze when he visited the island. A beautiful princess, it was said, lived with her two brothers in the strong castle of which this tower was a part. One day, as she was walking upon the sea-beach, — which just here is broad and inviting, — she

was surprised by a strong man, who had descended from his dwelling in the mountain which towers high above, a spot still pointed out by the shepherds as the cave of the powerful man. When her brothers found that she was pregnant, they roughly demanded the name of her lover; and, although she long evaded, they yet forced her to acknowledge it. The brothers thereupon drew lots, and the one chosen went out into the highlands above, lay in wait for the strong man, fell suddenly upon him, and murdered him in a spot still marked by tradition. The story doubtless shadows forth some actual event of Italian *vendetta*, as it appeared to the wild race of Greeks who inhabited the island before the Turkish conquest,—the daughter of a *comandante*, living far from the accustomed luxury of Genoese palaces, a concealed lover, and the covert vengeance of family honor.

It was during the period of Lesbian supremacy that Ciriaco di Pizzicelli of Ancona—the enthusiastic pioneer of Greek travel, whose descriptions of the Orient, especially of the state of the ruins of Athens at the middle of the fifteenth century are so valuable—visited Samothrace upon his second voyage to the East. The island was already in a state of ruin which could not have differed greatly from its present condition. Eighteen years after his visit (1462) Lesbos fell into the hands of the Turks, and with it, if not some short time before, the islands of the Thracian Sea. The Gattilusii were the first Catholic princes conquered by the advancing power of the Ottomans. The last of the family upon the throne, Nicolo Gattilusio, had murdered his elder brother to gain possession of the government, and yet hardly made a show of resistance against the more and more frequent incursions of the Turks. The city of Lesbos was surrendered by the intrigues of a bastard relation, Luchino Gattilusio, with Mahomet's general, Mahmoud Pasha. The Christian prince endeavored to gain the favor of his conqueror by embracing Islamism; but the sultan,

despising such cowardice and treachery, had both the Gattilusii transported to Byzantium and there executed, confiscating their extensive private property. The cruelties of the Turkish officials upon the capture of Samothrace have already been mentioned. After those dreadful scenes the island sank into the lethargic condition which has befallen all the more remote and commercially unimportant Turkish possessions.

Since then Samothrace has been visited by very few of the travellers who see its high peak as they pass into the much frequented channel to Constantinople and Odessa. It was nearly four centuries after the account left by Ciriaco before another was given. Von Richter visited the island in 1815, and his interesting account was published seven years after in a book which is the best monument to one who found so untimely a grave while in the midst of his investigations.¹ Three more reports were offered before the French *École d'Athènes* called the attention of its members to the island.² In 1853 several fragments of sculpture were brought from Samothrace to Paris, and three years later some slight investigations were made under the auspices of the French Empire.³ The most thorough account of the island has been given by the Austrians, under the eminent archæologist, Alexander Conze; first, in the above mentioned work on the four islands of the Thracian Sea, the result of a private journey, and later in the report on the excavations which were undertaken in 1873 and 1874 with funds supplied by the Austrian Minis-

¹ Otto Friedrichs von Richter. *Wallfahrten im Morgenlande. Aus seinen Tagebüchern und Briefen dargestellt von Johann Philip Gustav Ebers.* Berlin. 1822.

² Report of Messrs. Blau and Schlottmann in the *Verhandlungen der Königl. Preuss. Akademie der Wissenschaften zu Berlin.* Oct. 25, 1855.—De Behr. *Récherches sur l'histoire des temps héroïques de la Grèce.* Paris. 1856 — A. Conze. *Reise auf den Inseln des Thrakischen Meeres.* Hannover. 1860.

³ G. Deville et E. Coquart. *Rapport. Archives des Missions Scientifiques.*

try of Public Instruction. The results of the first year's operations have been published in a work which is a model of thoroughness;¹ those of the second season are still waiting for an artistic restoration of the Nike, but their appearance may soon be expected. It is needless to add that, after investigation so wisely directed and luxuriously published at government expense, there remains little or nothing to be expected from further excavations or archæological research upon the island. Attention is the more likely to be diverted from Samothrace, as there remain so many other sites of equal or greater importance which have received no especial investigation, where excavations will open a virgin soil.

Sailing eastward, upon the north of Samothrace we pass several hot springs, a great gift of Nature, which would be of the utmost importance were the island properly cared for. They are visited every summer by one or two families from the main-land, and should prove a great attraction as their fame extends and arrangements are gradually made to facilitate their use. The few visitors to the waters now content themselves with the simplest huts, and the site is entirely deserted in winter. At the eastern extremity of the island, its largest brook flows through a beautiful grove of oak and plane trees, where is a luxuriance of vegetation entirely unequalled in any other of the Aegean Islands, a paradise among their bare and sunburnt rocks. It brings to mind the epithet ἡλγεσσα bestowed upon Samothrace by Homer. On leaving this inviting spot, a heavy north wind carried the "Dorian" again to the Asiatic coast, past the gray-brown hills of Tenedos, and past the mole, then marked by a line of breakers, which sheltered the ancient port of Alexandria Troas. The city was once the second in importance of the

¹ Archæologische Untersuchungen auf Samothrake. Ausgeführt im Auftrage des k. k. Ministeriums für Kultus und Unterricht von Alex. Conze, Alois Hauser, George Niemann. Wien. 1875.

eighteen towns which bore the name of Alexander, which in this case was given it not by the conqueror himself, but by his successor, Lysimachus. Its situation, before the mouth of the Hellespont, which can be entered only with favorable winds, is wisely chosen, and would have deprived the opposite Tenedos of many of its signal advantages had it been possible to provide adequate shelter, by larger moles, for the fleets of vessels which are often obliged to wait in this vicinity. The ruins are scattered upon the oak-grown slopes, for the most part not visible from the sea.

Shelter from the increasing wind was finally found under the lee of Cape Baba, the historically celebrated Lectum. The squalid little Turkish village upon the rocky slope seems to be on the site of the town which Strabo mentions as here situated ; its castle commands the entrance to the Gulf of Adramyttium. Fragments of an ancient mole, built of colossal blocks of granite, still rise above the water, and somewhat shelter the port from the storms which have made this promontory notorious. The land eastward from the cape, the northern coast of the gulf, is high,—a rocky plateau, descending in most places abruptly to the water. A similar conformation occurs, farther on, at the site of Assos. Here the little port is at the foot of the steep elevation upon which the city stood. It is still sheltered by remains of an ancient mole. There was once a long breakwater here, which is mentioned by Strabo. It seems doubtful whether the present short mole, apparently repaired in the Middle Ages, is identical with that of antiquity, and could have afforded all the protection necessary for the port of the once commercially important Assos against the southern storms which in winter-time sweep with fury from the opposite Lesbian coast. Other boulders may be seen beneath the water in a certain regularity ; but no distinct outline of further shelter can be followed beyond that at present existing. The port of Assos must have been crowded with

shipping at the period of the city's supremacy, and it seems to have retained somewhat of its ancient maritime renown as late as the travels of the Apostles Paul and Luke, when the principal edifices of the upper town were already overthrown. The little enclosure at present existing can admit only ten or twelve coasting vessels, of a maximum draught of two metres. The trading ships of antiquity seldom exceeded these humble dimensions, and were in all respects more comparable to the light, keelless crafts of the modern Greeks than to the small vessels of English and American waters.

There are now standing two houses and a magazine at this port, the station of Greek tradesmen, who export grain and the acorn-cups of the *quercus aegilops (cerris)*, the stunted oak-tree of the surrounding country. The latter find a use like that of gall-nuts in the dyeing of cloth. Beyond these natural products of insignificant quantity, there is nothing to attract commerce to the northern Adramyttian coast, unless it be the striped mats woven in the poor harems of the Turkish village of Bayram, Bayramkoi, or Bayram-kalessi, as it is variously known, which stands above, upon the ruins of the ancient city. The languid inhabitants of its miserable huts are rarely visited by traders, and they require few imports. The only article of foreign manufacture in general use seemed to be Viennese lucifer matches.

The village is behind the ancient acropolis, which rises steep from the high plain, very near its sudden descent to the water. The summit of the acropolis is thus so directly above the port that a person standing upon its border, within a few steps of the southern stylobate of the temple, can look directly down into the holds of the vessels beneath. The ascent from the sea is the steepest and stoniest conceivable; the break-neck position of the city was notorious even in antiquity, among a people who found nothing remarkable in the climb to the Acrocorinthos or

to the acropolis of Segesta. Stratonicus, an Athenian musician and poet, famed for his witty remarks, applied to it the line of the sixth book of the Iliad,—

*Ασσον ἦ, ὡς κεν θάσσον ὀλέθρου πείραθ' ἵκηαι,

playing upon the adverb *ὅσσον*. Art has done surprisingly little to ease the natural difficulty of the ascent; here and there are fragments of ancient granite paving or polygonal retaining walls, but for the greater part one is obliged to scramble up the side of the natural rock. Donkeys take a roundabout way, diminishing the inclination of the road by increasing its length. If either of the trodden paths be deserted, the climb generally has to be performed with hands as well as feet. The plateau stretches far away to the west, falling again towards the north and east to the valley of the brook Tusla, which, encircling the city, reaches the sea a little way farther on.

The meadows bordering upon the brook are by nature exceedingly fertile; they readily account for the celebrity which Assos attained under the Lydians as the grain magazine of the surrounding country. The quality of its wheat was so superior that the kings of Persia imported it to distant Susa for their private use,—a luxury much disapproved of by Strabo. Pasturers of herds were never willing servants of Demeter; and now that the Turks, a people by nature nomadic and possessed with a supreme contempt for agriculture, have dwelt in the land for four centuries, this fertile plain brings forth but a small fraction of what it might be made to produce by thorough cultivation. The invincible repugnance of the Turk for all tilling of the soil is a characteristic of the greatest political and economical importance, especially as their contempt for the handling of the spade and the hoe seems to have communicated itself in full measure to other races inhabiting Asia Minor, as the Armenians and Jews. The Greeks alone, seeing in agriculture an immediate pecuniary advantage,

produce the grain and vegetables absolutely necessary for subsistence. In regions where Greeks are not tolerated, the most fertile meadows have become barren wastes.

The ancient city of Assos was grouped around the volcanic cliff which rises from the plateau, in much the same manner as was Athens at the foot of its acropolis; its



ACROPOLIS OF ASSOS. FROM THE HIGHEST POINT OF THE PLATEAU, N. W.

ruins are the most interesting remains of the Troad, and in some respects of all Asia Minor. The extent of the closely-built town is marked by the magnificent fortification walls. These massive structures follow the conformation of the ground in such a manner as especially to protect the points by nature most exposed to the attack of an advancing enemy. The stone of which the wall was built is a reddish ferruginous trachyte, cut into rectangular blocks, filleted carefully at the joints, and laid in exact horizontal courses without mortar, being bonded from face to face by headers. The interior spaces of the wall between these veins, from about one metre to one metre and a half broad, were apparently left hollow; they are now choked with rubbish, which prevents an adequate examination. Throughout the entire length of the fortifications which remain, over three kilometres, the wall is built with unvarying care. The greater part of the circuit around the acropolis can be traced; it is only at the north, near the precipitous descent from the present village to the valley of the brook, that its position is for any extent uncertain. The gateways were flanked with towers, the lower parts of

which, provided with loop-holes, are standing. In the gates themselves the bolt and pivot-holes are visible. The fortifications present, in every respect, an unequalled opportunity to study a class of Greek stone-work of which we have little knowledge.

The walls of Assos are as different as possible from the rough ramparts of Samothrace. One cannot ascribe this dissimilarity to any known difference in age; in neither case is there the slightest ground upon which to base an opinion as to the time of the erection of these great masses of masonry. Above the gate-openings of Assos there are circular and pointed blind arches, cut from the horizontal courses. This mannerism, common enough in Greek remains, as at Ephesus, Thoricos, Messene, etc., by no means speaks for great antiquity, as is sometimes supposed by those who argue that at the time when such a form was adopted the principle of the keystone arch was necessarily unknown. The exceeding exactness of the stone-cutting, and the wonderful state of preservation of some parts of the wall, also incline to the assumption of a late date of building; but, on the other hand, there is no period of the city's history, after the Persian conquest, which readily explains the erection of so gigantic fortifications. "Nature and art," as Strabo says, "had indeed united to make Assos a stronghold." The condition in which the walls at present stand shows the remark of Texier to be hardly an exaggeration: "They seem rather a commenced and unfinished work than a ruin." They deserve more attention than has hitherto been bestowed upon them, and would repay a more complete and more accessible publication than now exists.

The town, within the outline of these fortifications, was divided into two parts by another wall,—weaker, and not provided with towers,—which runs from a re-entering angle of the western circuit to the cliff of the acropolis. The

southern and larger of these enclosed spaces, on an inclined strip of the plateau which remains between the acropolis and the declivity to the sea, contains the chief ruins of the lower city, overthrown in indescribable confusion. The irregular ground must have been terraced in antiquity, somewhat as is the steep upon which the former city of Syra is situated. It is covered with the ruins of buildings of every description, all of the local stone; there is not a fragment of marble as large as one's hand to be found far and wide around the city. The lime-burner has made more thorough work at Assos than at any other site of Greek antiquity. Great quantities of mortar were necessary for the coarse masonry of the towers and cisterns built by the Genoese rulers in the Middle Ages, and for all the more recent structures of Assos,—built of a material so hard as to defy superficial cutting, thus leaving wide interstices between the separate stones. But the necessities of the mediæval and modern town itself are not sufficient to explain the destruction of every fragment of limestone in Assos. It may reasonably be supposed that a number of kilns existed here in the Byzantine period, and supplied neighboring ports with their produce until the material of the neighborhood was entirely consumed.

These ruins would have been incomparably interesting if the marble, which, from the analogy of other Greek cities of Asia Minor, and notably of the Troad, must have existed upon the plateau, had not thus been swept away. The remains of coarser materials are, however, themselves of great extent, and are sufficiently important to insure the attention of science. The ruins of Assos fully warrant the opinion of that eminent authority, Colonel Leake, who thinks that they give perhaps the most perfect idea of a Greek city that anywhere exists. Those of the town are thrown together in the wildest disorder,—antæ, columns, and their members lying upon the foundations of the buildings. It is only occasionally that a granite column

or carefully built wall still stands upright. Almost all the architectural members are Doric, generally of late Greek character. The prevalence of this style is in great measure due to the hardness of the stone, granite and volcanic rocks lending themselves more readily to the broad and simple form of the Doric than to any other style. The carving of Ionic or Corinthian capitals in such a material is almost impossible. Lighter and more elegant structures must have disappeared under the lime-burner's gleaning.

Prominent in the confusion are enormous blocks, attributable to the parallel walls of a stadium or agora, and the semi-circular auditory of a theatre. The latter is in an exceptionally fine state of preservation, doubtless the most perfect of the many theatres of Asia Minor and, in some respects, of all to be found in Greek lands. It has been partially overthrown by an earthquake, but the greater number of the seats are almost perfectly intact, as well as the vaulted entrances and even part of the stage. Unquestionably of the Roman period, it offers many peculiarities when compared with contemporary buildings of like character, approaching very nearly in arrangement to that advocated by Vitruvius. The seats are partly worked from an inclination of the ground. Although situated far below the acropolis, they are still high enough to give a grand and beautiful view to the spectators, who, facing south, could look far across the Gulf of Ida to the promontory of Musconisia, and to the noble and pleasant island of Lesbos, dear to the Greek heart.

The enclosure of the ancient Assos, upon the other side of the division wall, north and northwest of the acropolis, where stands the present village of Bayram, seems to have been an addition to the city's original extent, and was perhaps not so thickly built upon as the southern terraces. The Greeks have preferred in all ages the southern exposure, recommended by Xenophon, when not subject to the reflection of the sun upon the sea;

their towns are often in still hotter and drier situations even than Assos. The ruins upon the northern side of the acropolis seem to show that ground not to have been chosen as the original or principal position of the city; the remains there are not well preserved, being built into and covered by the present hovels.

The mighty granite blocks of the Mount Ida range, from which almost all the houses of the southern Troad are constructed, appear strangely out of place when made to assume the squalid architectural forms of Turkish huts, originally decided by the mud and sun-dried bricks of which they elsewhere consist. From the universal verdict of travellers, the inhabitants of Bayram have obtained an unenviable reputation. Their village now seems partially deserted. Above it rises the volcanic acropolis, dry as the driest deme of Attica, and with as beautiful and majestic an outline as that of the treeless mountains which bound the Athenian plain. It is now entirely deserted; blinking owls sit in the clefts of its dark gray ruins, and the unwonted sound of the visitor's footstep disturbs the whirring partridge, the shy bird rising from the midst of one of the most populous of ancient cities. The acropolis is a mighty block, truncated like a footstool, with two steps, the highest being towards the sea. It was not at all fortified. Its steep sides, from which much of the coarse stone of the buildings of the town below was apparently quarried, hardly needed any such protection against the primitive attacks to which it might be exposed in antiquity. The fortifications of Assos were restricted to its outer walls.

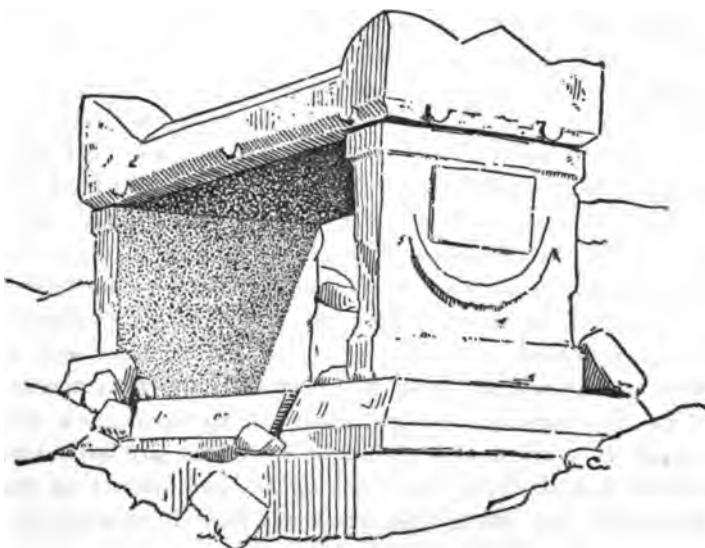
The mosque of Bayram, an early Byzantine church little altered for Mahometan ritual, stands upon the edge of the acropolis, next to the town. The building was apparently erected upon antique foundations. Near it there are extensive subterranean cisterns, now unused,—immense constructions, from fourteen to sixteen metres deep. These and the ruined mediæval watch-tower near by were probably

built during the time of the Gattilusii; from the height of the latter a great part of the Princedom of Lesbos could be overlooked. The interior of the tower could not be examined, as the entrance is choked with rubbish fallen from the walls above, and erected as a barricade. Many blocks of Greek workmanship must have been built into it, and could be easily recovered. The Genoese occupation of the country is still familiar to the inhabitants of Bayram, to whom all antiquities, of whatever age, are Frankish. The summit of the acropolis is confined; the large temple which was upon the higher step took up the greater part of its extent. It stood almost upon the southern edge of the cliff, and must have afforded a magnificent spectacle from the sea and from the port beneath.

All Doric temples are built to be seen with the perspective horizon far below the stylobate; many peculiarities of the style are to be explained only by this consideration. The situation of the temple of Assos rivals even that of the Athenian Parthenon; it was as conspicuous from the sea as that of Sunium, and as favorably situated for the city and the inland country as that of Segesta. The building is at present entirely overthrown; its stones are scattered over all the acropolis, some even rolled from the height into the eastern valley of the brook. The *grandes constructions militaires modernes*, which stood upon its plan at the time of Texier's measurements, and seem to have been a serious hindrance, have since been entirely demolished, and some blocks of the temple structure, which will assist in its restoration, were readily found. Among these may be mentioned a corner block of the tympanon corona, which will supplant the fallacious method of determining the pitch of the gable by the inclination of the cornice mutules beneath; unornamented stones of the exterior architrave, fragments of the door, and more perfect triglyphs. On the other hand, it must be confessed that, without some digging, and a small derrick to overturn heavier blocks, it would be

impossible to verify or refute several points definitely given by Texier, such as the arrangement of the temple plan, its exact extent, the position of the cella wall, and even the height of the columns, though this would be easy from the excessive diminution of the high drums, were it possible carefully to measure them, half buried as they are in the earth. The statement that the temple was a hexastyle peripteros, with thirteen columns in length, is apparently a mere supposition, which may be doubted from the analogy of all other archaic temples known, none of which have so small a number of side-columns. An accurate determination of these points is greatly to be desired. The measurements given by Texier are in the main correct, though the details vary so much among themselves in dimensions that absolute precision in any one number is out of the question. All the architectural members preserve a wonderful sharpness of outline; they seem as fresh as when first cut, owing to the exceeding hardness of their substance. This admirable preservation is especially fortunate for the sculptured remains, such as the reliefs of the architrave and metopes, now preserved in the Louvre, and well-known from their important place in the history of Greek sculpture.

From the acropolis the ruins of the ancient city can be seen stretching far away in every direction. A multitude of sarcophagi lie in a zone to the westward, which extends from the sea to the descent to the brook. These tombs stand closely crowded together upon each side of a sacred way, generally in an entirely irregular arrangement. All those preserved are of granite and trachytic stone, built without mortar and without dowels. It is futile to attempt to gain from their material any understanding of the strange ancient mention of the flesh-devouring stone peculiar to Assos, which has given to such tombs in modern ages the name "sarcophagus." Apparently all have been opened and their contents rifled. In cases where the cover



SARCOPHAGUS AT ASSOS.

was too heavy to be removed, the sides have been broken out. Some of the tombs have been dragged away at various times towards Cape Lectum, and even across the brook to neighboring villages, where they serve as well-troughs, for which their forms are adapted. Those remaining upon the field are generally in their original position and are often excellently preserved, the materials of those now existing at all not being of sufficient value to attempt their removal or destruction. The forms of the funeral monuments vary much; many are of elongated rectangular plan, with gabled cover and acroterias.

Beside the simplest stone coffins, there are the remains of large mausoleums, at times several tombs upon one foundation, perhaps the enclosure of a whole family. The larger structures often appear so similar to a temple *aedicula* that it would be impossible to determine their destination surely without long examination and the overturning of many fallen blocks. These broad fields of the dead are

of great importance in architectural respects, and are truly worthy of far more attention than has been bestowed upon them. No views of the sarcophagi and the other remains of this part of Assos have been published, with the exception of two careless sketches in Fellows's "Journal." From the entire lack of inscriptions, which must have disappeared with the marble upon which they were cut, it seems impossible to ascertain the exact age of any of the monuments of Assos. Granite and basalt bear no letters. The date of the great temple upon the acropolis is especially doubtful, although its sculptured remains lead to conclusions which prove it anterior to the fifth century B. C. It is always difficult, however, to distinguish that which is archaic and primitive in Greek art from that which is barbarized and provincial. The history of the city alone can throw light upon the periods in which the erection of so colossal a temple, the building of the fortification walls and of the theatre and agora, and the arrangement of so extended a necropolis, could be assumed to have taken place.

Assos was successively under Aeolian Greeks, Lydians, and Persians. It was a colony of Methymna, the native town of the singer Arion, one of the six chief cities of the ancient Lesbos. That powerful island, celebrated in the early Greek ages as the home of lyric poetry, represented the highest contemporary advance of Hellenic civilization. Assos was its chief colony at the time of the greatest Lesbian power; and the favorably situated settlement doubtless early rivalled the greatness of the cities of the mother island. For some five centuries it flourished and increased, possessing a large tract of the surrounding country, until, when taken in 560 B. C. by Croesus, it was the strongest and most important place in the Troad. On the downfall of the Lydian rule, after its fourteen years of supremacy in Assos, the city passed into the hands of the Persians.

During the reign of Artaxerxes it was the residence of the eunuch Hermeias, who here braved the power of the monarch until, betrayed by his enemies, he was sewed into the skin of an ox, dragged to the Persian capital, and crucified. Hermeias, a scholar of Plato, and himself the author of an esteemed work upon the immortality of the soul, had attracted to Assos his fellow pupils, Xenocrates and Aristotle, the latter of whom was further related to him by marriage. The city appears to have been one of the chief seats of refinement and learning during the fourth century B. C. After the Roman period, it soon became Christian, perhaps because of the proximity of the seven churches of Asia, the influence of which spread especially to the north. The early change to Christianity accounts, without doubt, for the entire overthrow of the larger monuments and temples, many of which bear the marks of wilful destruction. It was fortunate, for the further preservation of the remains, that Assos became almost entirely deserted. The lower town bears no trace of dwellings later than the first Christian centuries. Byzantines, Genoese, and Turks have contented themselves with the fortification of the acropolis, and with the small collection of dwelling-houses upon its northern side.

The ruins of Assos were slightly mentioned by M. de Choiseul, in the "Voyage Pittoresque." The first traveller who gave any distinct account of them was Leake, who visited the site in 1800, first publishing his short notice in Walpole's Memoirs, twenty years afterwards,¹ and again including it in his own Journal.² Dr. Hunt saw the ruins one year after Leake. His excellent report was the first notice printed concerning Assos.³ It is an error of this writer

¹ Travels in Various Countries of the East, being a continuation of Memoirs relating to European and Asiatic Turkey, etc. Edited by Robert Walpole. London. 1820.

² Journal of a Tour in Asia Minor. By William Martin Leake. London. 1824.

³ Report of Dr. Hunt in Memoirs relating to European and Asiatic Turkey. Edited by Robert Walpole. London. 1817.

to state the city walls as five miles in length. This is greatly exaggerated; their maximum extent is not half that distance. He was succeeded by Von Richter, in 1815,¹ and by Michaud, one of the authors of the "Correspondance d'Orient," in 1830.² The latter writer, a French academician, has some remarkable ideas. The sculptured architrave reliefs of the great temple, generally interpreted as scenes from the myths of Pirithous and Proteus, to him "represent different scenes of the customs of the ancient people of Assos," whom he seems to have imagined as sphinxes, centaurs, and heroes, accustomed to struggle with marine monsters. The Byzantine church, "*moitié carré, moitié conique*," he speaks of as "*un ancien temple de forme élégante*," maintaining that "*la religion musulmane nous a ainsi conservé dans son intégrité première un monument appartenant aux beaux âges de la Grèce*." By far the best of these travellers' descriptions is the account given by Prokesch von Osten, who visited the ruins of Assos in 1826, in his most admirable book of Oriental Notes, which justly led to the author's preferment to the highest official position in the gift of his government.³ The attention of the French seems to have been attracted to Assos by Michaud. Five years after Michaud's visit, Texier examined the ruins during his expedition to Asia Minor, publishing subsequently the only measurements and illustrations of the wall, gates, and temple which exist. Texier was commissioned by Guizot, then French Minister of Public Instruction. His drawings and descriptions were engraved and printed at government expense, in three immense volumes, in the second of which are the letterpress and plates concerning Assos.⁴ It is from this

¹ Work cited above (p. 143).

² Correspondance d'Orient. Michaud et Ponjoulat. Paris. 1834.

³ Denkwürdigkeiten und Erinnerungen aus dem Orient, vom Ritter Prokesch von Osten. Aus Jul. Schneller's Nachlass heransgegeben von Dr. Ernst Mürsch. III. Band. Stuttgart. 1837.

⁴ Description de l'Asie Mineure faite par ordre du Gouvernement Français de 1833 à 1837 et publiée par le Ministère de l'Instruction Publique. Par Charles Texier. Deuxième Partie. Deuxième Volume. Paris. 1849.

book alone that the world has derived all the information concerning the forms and dimensions of the remains at Assos which has served scholars for so many theories concerning the development of Greek art. Yet the "Description of Asia Minor," in attempting to cover too wide a field, devotes only five plates to the extensive fortification walls and the temple, exclusive of the untrustworthy topographical map and the engravings of the reliefs carried to France. During a second voyage to the East, Texier secured the sculptured architrave stones subsequently placed in the Louvre, the gift of Sultan Mahmoud II. to France. It is strange that these valuable reliefs remained so long upon the site, attracting as they had the notice of all travellers who visited Assos previous to their removal. Texier was followed by Fellows, who gave a good description of his visit of 1838, in a valuable journal.¹

The last mention of the ruins was printed by Mr. Pullan, in 1865, four years after a hurried journey, in a book which is a partial translation of Texier's text, without the slightest additions, illustrated by lithographic reproductions of the French engravings.² The last visit before our own to the neglected ruins was undertaken overland from Hissarlik, by Drs. Virchow and Schliemann. Of this nothing has been published. It is not clear upon what authority Falkener stated, in 1851, that the frieze of the great temple of Assos, with the exception of the guttae, is totally omitted; at all events, this is an error.³

It only remains for the writer to give a most favorable report concerning the expectations which may be entertained from excavations upon this spot and from a thorough investigation of its ruins, both of which were

¹ A Journal written during an Excursion in Asia Minor. By Charles Fellows. London. 1839.

² The Principal Ruins of Asia Minor, illustrated and described. R. Popplewell Pullan. London. 1865.

³ The Museum of Classical Antiquities. Volume I. No. 23. On the Ionic Heroum at Xanthus. London. 1851.

beyond his power and aim at the time of his visit. Assos is one of the very few sites of a flourishing city of Greek antiquity where the earth has not been in the least overturned in search of relics, either by authorized excavators, or by the destructive predatory digging of the inhabitants themselves for marketable fragments, vases, and coins. It is known to what extent the lower classes of Greeks have recently plundered the most promising ruins of Attica and the Peloponnesus, and how regular an income was formerly derived by the peasants of Calabria and Sicily from their independent discoveries. In a Turkish province, but rarely visited by Europeans, this robbery is impossible. The villagers of Assos are too fanatical to come readily into intercourse with unbelievers, or to allow unauthorized speculators to rummage in the earth of their neighborhood; they are too limited in understanding to enrich themselves by the recovery of the treasures of antiquity, to them entirely insignificant. All that has been brought from Assos—and this includes some of the chief treasures of antique sculpture in Paris—was taken from the surface. The decline of the city's importance, and the contraction of its extent at an early period, were also favorable to the preservation of its remains. Assos was almost deserted at the beginning of the Christian era. It is true that the ruins have not been protected by earth washed down upon them by streams, a burial which has proved fortunate in several cases; yet a dry soil has accumulated during centuries, perhaps sufficient to hide the blocks first overthrown as effectually as if they were buried six metres deep. The earth at Assos could be easily removed from the spots chosen for examination. Trial-pits and the digging and carting away of such great masses of gravel and marshy soil as rendered the excavations at Olympia and Ephesus so expensive would not be necessary at Assos. Were the results to be encouraging or disappointing, they would, at all events, here be quickly arrived at. A small derrick and

rollers would be necessary to displace the fallen stones; an excavation beneath these would expose the entire plan of the ancient acropolis, so far as this may be preserved. Were the arrangement of the temple to be ascertained, it would be a gain for architectural archæology which can hardly be overrated. The details of the elevation and its exact proportions would certainly be learned from a thorough examination of the site. Additional fragments of the sculptured decoration of the building might also be hoped for. A plain architrave block was found in the valley, which agreed exactly with the dimensions of those carried to France. This makes it probable that the sides of the temple were not ornamented by reliefs, and that these were restricted to the fronts, as are the sculptured metopes of the Theseum at Athens.

The plan of the temple of Assos was without doubt hexastyle; the architrave upon each front must have been nearly thirteen metres long. Texier discovered about sixteen metres' length of sculptured blocks, from which it may be concluded that at least both fronts bore these remarkable figures. The remaining ten metres, of a material not likely to excite wilful destruction, and secure from natural weathering, probably lie near at hand. Dr. Hunt mentions, among the architrave reliefs which lay upon the earth at the time of his visit, "three horses running": these were not among those taken away by Texier. Of the twenty sculptured metopes which must have existed,—if the front alone, according to the analogy of the architrave reliefs, be supposed thus ornamented,—only three have been carried from the site. From the great wealth of sculptured decoration elsewhere employed upon the building, it must be concluded that gable groups also existed. If these were likewise of the hard stone, they may be expected to be found; if they were of marble, there is still the possibility that their early fall may have kept them hidden beneath the overthrown ruins, secure

from the mediæval lime-burners. What an interesting Asiatic parallel to the Aeginetan marbles may here come to light!

The remains of the town below, though for the most part of a later period, are still worthy of thorough investigation. It is likely that much marble lies beneath the surface, and the domestic architecture of the Greeks could here be studied as at no other spot. No plans of the theatre, notwithstanding its admirable preservation, have been published, if we except the slight sketch in the topographical plan offered by Texier, where measurements are not given. Fragments near the spot may, upon adequate examination, lend themselves to a solution of the vexed question as to the thymele. A description and drawings of the sarcophagi without the city walls would be particularly desirable, and here much might be expected to be unearthed. The many fragments of carefully painted ancient vases which lie here seem to promise the existence of inimitable works of Greek pottery in the graves beneath.

The situation of the ruins in Turkish territory greatly facilitates the obtaining of a favorable permission to undertake excavations, which are not to be entered upon in Greek lands save by the sacrifice to the Government of all that may be discovered. The latter consideration cannot be too much emphasized in view of the discouraging contracts which the officials of the Greek kingdom, and even of semi-independent Samos, have forced upon scientific societies desirous of excavating. The immediate proximity of Bayram to Mytiline, and its ready accessibility to Smyrna, would greatly favor an expedition. The village itself offers the most immediate necessities, and would obviate the great expense for the transport of all food and the erection of temporary lodgings, to which excavators upon such entirely desolate sites as Delos or Hissarlik have been exposed. The writer recommends the site to the attention of the

American Archæological Institute with assurance, aware that his favorable opinion concerning it is shared by eminent European authorities, who have had opportunity of examining its acropolis and wide-spread fields of ruins, or are acquainted with its present condition from trustworthy reports. A comprehensive and thorough publication of the remains of antiquity at Assos would supply a decided want.

JOSEPH THACHER CLARKE.



